THE FARMERS' REGISTER.

VOL. I. SEPTEMBER, 1833. No. 4.

EDMUND RUFFIN, EDITOR AND PROPRIETOR.

ON THE INFLUENCE OF PARENTAGE ON OFFSPRING, IN BREEDING ANIMALS.

To the Editor of the Farmers' Register.

The prejudice against speculation may be carried too far in matters which have not attained to perfection. No subject affords a wider scope for investigation, than those to which the Register is devoted. Among us, agriculture is certainly in its infancy, and its zealous friends are left to inquire whether we had better entirely depend for information on writers in foreign lands, where soil, climate, political institutions, and popular habits are so different from ours—or occasionally make some efforts to grope our own way through the mystery that surrounds us. Until we begin to interchange opinions with each other, it is not likely that our interest in the subject will become very deep.—And although we smile occasionally at each other's notions, yet I feel assured it will be the smile of good nature, and that any original article that may appear in the Register, written with a sincere desire to search after truth, will be received with pleasure by its readers. Indeed, sir, I feel so certain that this apology is unnecessary, that I would not make it, were I not assured that many much better qualified are deterred from writing by these *good natured* smiles. My excellent neighbor,——, could furnish you with an article on the culture and management of tobacco, or on many other subjects, which you would gladly receive, were he not afraid of finding by the succeeding number of your work, that some person had been greatly amused by it.*

In your second number, I read with much pleasure, some sensible remarks extracted from the New England Farmer, on the subject of breeding cattle. The hereditary transmission among brute animals of peculiar powers and qualities, from ancestry to offspring, has, in some countries, long excited great interest among farmers as well as gentlemen of the turf. We in Virginia delight in looking at fine horses, and riding them too; and some few among us know very well how to raise them. But, in the general, we are guided more by fancy for the individual animal, or the price of the season, than by the rules of breeding. The most common error is, to breed from a small delicate mare and a large coarse horse, and vice versa—thus destroying every natural tendency to the production of peculiar powers and qualities, and reducing the race of our horses to a standard of common mediocrity. In rearing cattle, we *seem* to have a rule, which is, to breed from that race which can most hardily endure the extreme of privation in food, water and salt, the most cruel beating from negroes, and which requires the least shelter from weather. Whatever may be its design, its certain tendency is, to produce the most worthless animal that the race is capable of affording. I have known a man, who experimented with so much economy, as actually to ascertain that a cow could be sustained through a hard winter on a single ear of corn a day. This beats Paddy's horse, for he died as soon as he had learned to live on nothing.

Having, in the general, in my section of the state (the tobacco region,) a stock of cattle descended from ancestry reared according to the foregoing rule, we have felt but little need of any other rules; for with but one breed, we could not well apply rules for mixing breeds. For some years however a spirit has been awaking for improvement on this subject, and although not general, and not often directed by skill on the subject, has already produced very manifest benefit. This spirit has led to the raising from the best animals among us, and in some neighborhoods to the purchase of cattle from the mountains. And, until animals of the peculiarly fine races become more common, we will have to rely chiefly on these sources. I am very glad to learn that there are gentlemen in various parts of the state who have been willing to incur both trouble and expense, in order to introduce stock of cattle, hogs and sheep, of superior races. I expect that much benefit will result to the public, and I hope also to these patriotic individuals, from their efforts.

I should be highly pleased, were it in my power, to furnish an abstract of all that is known on the subject of breeding. If there be infallible rules for improving the breeds of animals, in relation to any given points of form, powers or qualities, I have not access to the books which contain them. But having long been an observer of the laws by which nature seems to regulate the transmission of these things from parents to offspring, I have thought the result of my observations might not be unacceptable to you and your readers. I will attempt to offer them in the following propositions.

1. The direct offspring of two animals, belonging to different races of the same species, partake equally of the peculiarities of both parents, in color, form, powers and properties, and may be called mongrels. The mulatto, whose parents are, one white and the other black, forms a suitable example of what is here meant, for in every particular he seems to stand half way between the white man and the negro. I would advert particularly to the mongrel character of his hair: it is neither straight nor very much crisped, but woolly. Animals of this description, while they

*If any person could be so regardless of propriety as to play the critic in the manner and under the circumstances supposed above, the chances would be twenty to one that he would place himself in a more ridiculous situation than him who was the subject of his strictures. The observations of plain practical farmers will be always read with attention and respect—not only from motives of kindness and courtesy—but because the sound sense and solidity of their instruction deserve and command respect. There is nothing more mistaken than the general opinion of practical farmers, of their unfitness for writing. We are well experienced (at least) in the reading of agricultural journals, and can conscientiously declare that the pieces that are best received, and considered most valuable, have generally proceeded from the pens of men who at first could scarcely be induced to use them, from their too humble estimate of their own powers.—[*Ed. Farm. Reg.*

are almost certain to attain to mediocrity in physical qualities, rarely rise much above it in any one particular. The offspring of the blooded racer and the dray horse, for instance, might transcend the former in weight and strength and the latter in speed, while his running powers would bear no comparison with those of the former, nor his size and strength with those of the latter.

2. In order to form distinctively a new race possessing some characteristic peculiarities, it is necessary that both parents should be mongrels, similarly descended. An example of this kind occurs in the offspring of two mulattoes. Persons of this description approach towards the peculiarities of the Indian. They are apt to be straight, active, delicate, and somewhat deficient in strength. Their most striking peculiarity, however, is a remarkable glossiness of hair. This, though often perfectly straight, is sometimes curled, yet always shining and free from crispness. I have been able, from this appearance of the hair, to pronounce—and on inquiry found the opinion correct—that a child, itself nearly black, being three-fourths negro, had white blood through both parents. The mongrel between the hound and cur dog mingles the qualities and appearance of both races remarkably, but the offspring of two such mongrels, is a slender swift animal, somewhat resembling the wolf in appearance, and possessing such a wolf-like propensity to attack sheep, as to insure its own extinction as a race wherever I have known it.

It is generally believed that animals take size from the sire: this is certainly true with the canine species. I have known many a very large dog whose mother was a fice, and I own a very small one whose mother was a hound of ordinary size. I mention these facts, with a view of suggestiug, that it might be proper, in order to obtain in perfection the characteristics that might belong to a new race, to alternate the sexes of its progenitors in such a manner, as that a due transmission of the qualities to be derived from each of the sexes might be insured. For example, I have been informed by a friend, that the Durham short horned breed of cattle may be produced by crossing the Holderness with the Alderney breed. Now, I would judge it necessary, in order to give sex its due influence on the progeny, that the sire of one of the mongrel progenitors of such a race, should be a Holderness bull, and that of the other an Alderney. Indeed, the objects in view might possibly be more perfectly obtained, by beginning with four animals bred with reference to this principle. It may be here objected, that so much intricacy in the formation of a new race, seems to be in opposition to the simplicity of nature. But we find nature—while she sufficiently yields her secrets to patient observation, for all useful purposes—constantly guarding the durability and value of her works against the injuries of mere casualty. It is not difficult to conceive what a mongrel world this would have been long since, if simply a first crossing of animals could have constituted the fundamental characteristics of a distinct race.

Some distinguished breeders have held the opinion, that breeding "in and in" affords important benefit in the improvement of stock. May not this have arisen from the better opportunity thus afforded of more perfectly mingling the elementary essentials of a new race? Nothing, I believe, is better settled among us Virginians, than that this practice will deteriorate an old established race. And we find it necessary to change our breeding animals frequently. My own cattle are descended from a stock which, five and twenty years ago, were remarkable for size and deep milking. They were the offspring of an imported English bull—I know not of what peculiar race; and although some slight resemblance to their progenitors may still be seen, yet they are now small and very scanty milkers. This I ascribe chiefly to breeding in and in. The distemper among them almost compelled the continuance of this practice, as it destroyed new comers. I am now determined to introduce a new set and brave the risks of that malady.

I profess to know very little on the subject of breeding horses. What I have to say, should, of course, be taken in the way of surmise. I believe it is generally admitted, that a great improvement in the breed of race-horses was effected by the introduction of the Arabian horse into England. Now, in conformity with the foregoing principles, I would suppose that mongrels, or animals produced by the first crossing between the Arabian and the old English horse, would not distinguish themselves so admirably on the turf, as their offspring who might inherit the blood of the Arabian and of the old English race horse, both on the side of the sire and the dam. And further, those breeds which have distinguished themselves greatly on the turf, will probably be found, on examining into their pedigree, to have inherited an equal share of Arabian blood from the male and female progenitors.

There can be no doubt but that nature is regulated by fixed laws in the formation of distinctive breeds or races of animals, which, if known, might guide to the transmission of any particular desirable quality. In attempting to devolope these laws, we may readily conclude that they are not to be found in the first cross, because of the unequal influence which the sexes exert on their progeny, and because of the multiplicity of races which would thus be formed, liable constantly to deterioration from every admixture. We must then seek for them, by breeding in and in, from the same stock, until we get a due mixture of the two races used in the experiment, or—which I would think better—breeding the subjects of such an experiment, with animals similarly descended.

It is as certainly necessary that we should endeavor to find out the laws of nature in this matter, as that we should ascertain those which regulate her in the growth of our crops. Some of the gentlemen who have paid great attention to the pedigree of fine horses, and to breeding them, could doubtless afford us valuable information on this subject. It would at least be a source of amusement, to see a precise calculation of the quantity of Arabian blood in both the sires and dams of some of our noblest animals of this species.

A. B. C.

MEANS FOR RECLAIMING WASTES FORMED BY SEA SANDS.

To the Editor of the Farmers' Register.

Williamsburg, August 2d, 1833.

I send an extract from an article in the last No. of the Foreign Quarterly Review, which I think contains information that will be valuable to farm-

ers who reside on the sea board. On the Chesapeak bay, and at the mouths of our rivers, and perhaps for a considerable distance above their mouths, the sand is making fearful inroads upon the land, and to all who have suffered from this invasion, the subjoined extract may be of the greatest importance. I regret that I have not leisure to make a comparison between the district of country mentioned by De Candolle, and our own. It may however not be amiss to remark, before I conclude, that the Scotch broom (*Spartium Scoparium*) which is found in this neighborhood, and is most abundant in Warwick, will probably answer the purpose of the *Genista Scoparia*, with which I am not acquainted. J. P.

"No districts of country appear so hopeless of being reclaimed from utter barrenness as those which are subject to a periodical invasion of sands blown over them by the prevalence of certain winds. The sands on the sea shore, from whence this supply in general originates, by their capillary action, attract and preserve in their interstices, the water which may chance to be beneath them, or perhaps the soft portion of the sea water itself, and consequently they are always somewhat moist at a little distance below the surface, though the extreme dryness of the surface itself prevents any vegetation from fixing itself upon it. In Holland, England, and other countries where this is the case, it is usual to plant and preserve with great care, the sea grasses and sedges (*Arundo arenaria, Elymus arenarius, Carex arenaria*, &c.) which possess long creeping rhizomata, sufficient in some measure to bind the sand, and check its being drifted by the wind. But this expedient is very limited in its effects, and not to be compared with the benefits that have resulted from planting timber in the manner that has been practised on the coast of Gascony, where it was first adopted by an engineer of the name of Bromontier.

"'Bromontier's plan,' says De Candolle, 'is wonderful for its great simplicity. He sows in the driest and most shifting sand, the seeds of the broom (*Genista scoparia,*) mixed with those of the sea pine (*Pinus maritima,*) and then covers over the spaces that are sown with branches from the nearest pine forests, by which means the sand is, to a certain extent, prevented from shifting.—The broom springs up first, and thus serves the double purpose of further restraining the sand, and of nursing the young pines. The latter grow for seven or eight years under shelter of the broom, whose foliage becomes mingled annually with the sand, which it thus partially fertilizes. After this period the pine overtops the broom, and frequently entirely kills it with its shade. In ten or twelve years the rising forest is thinned for the manufacture of tar, and for procuring branches to cover the newly sown districts. After twenty years have passed, a fall of the trees commences for the manufacture of resin. These forests, placed on the dunes, (drifting sand hills,) along the sea side, shelter the whole country behind them from the continuous action of the westerly winds, and thus, whilst they themselves yield a supply of an important article of commerce, they protect the produce of the rest of the country. It is highly desirable that this prodigious undertaking, the most splendid agricultural enterprise of our age, should gradually be completed, and thus provide a shelter for the whole district between the mouths of the Adour and Garonne. I regret that the character of this work does not admit of my entering into further detail, and I close this account by stating that I have herborized during a whole day in these forests sown by Bremontier on perfectly dry sand, upon which, before his time, there could scarcely be seen any trace of vegetation."

"GENERAL DESCRIPTION OF VIRGINIA"—REPLY TO THE REMARKS OF "G. W. F," AND THE STRICTURES OF "MOCKJACK."

To the Editor of the Farmers' Register.

In the 3d number of the Register, two writers have noticed, in a widely different spirit, the "General Description of Virginia" which was transferred to your first number from the Encyclopedia Americana. Your correspondent G. W. F. seems to have justly regarded the task of presenting a brief yet faithful outline of the moral and physical features of a country, as one of no inconsiderable difficulty. To select from a mass of materials derived from different sources and on various subjects; —to reconcile discordant statements,—and compress the whole within *prescribed limits*,—without omitting any thing very essential, and at the same time without sacrificing the interest of the narative, may appear not very laborious or difficult to the cursory reader;—but to him who has achieved it, it is known to be full of embarrassment. In the performance of such a task, where so much reliance is unavoidably placed upon the testimony of others, and so little upon the personal observation of the writer,—even with the utmost fidelity of purpose, all that could reasonably be expected, would be something like an approximation to truth. We know that the sources of error are almost universal, embracing not only the frequent illusions of the senses, but the infinitely varied causes of prejudice and false judgment. G. W. F. is one of those who would justly appreciate considerations like these. He would kindly commend where he thought commendation due, and would frankly point out errors and omissions wheresoever they existed, not so much indeed from the gratification of exposing error as from the higher gratification of vindicating truth.

The author of the "General Description," never having seen himself the natural bridge in Scott county, regrets that whilst collecting his materials, he was not fortunate enough to light upon Col. Long's interesting account of that singular structure. The result of actual observation by a man of science and taste would have promptly received the notice to which it is entitled. Authorities, however, of scarcely inferior weight and of equal respectability were consulted, and formed the ground of the opinion respecting the bridge in Scott county compared with the one in Rockbridge. The late Francis Walker Gilmer, a man of accurate observation and extensive attainments—who travelled much in western Virginia, and was perfectly familiar with the country—in an article which he wrote for the 1st American editor of Rees' Cyclopedia [see Tit. Virginia] speaks in the following terms of the natural curiosity in Scott, comparing it with its more illustrious rival in Rockbridge. "There is another natural bridge in Scott county of nearly the same height, that is to say 200 feet, but from the thickness of its arch

less beautiful." Another distinguished gentleman who now resides in western Virginia, and who was especially appealed to for information on the subject, furnished a detailed description, from which the following is extracted. "The natural bridge in Scott is rather a tunnel through a hill than a bridge. I have never visited it but once, *not thinking it worth a second visit*, though I often pass within a few miles of it. The arch of the lower or southern end is said to be 200 feet high, though it appeared less to my eye.—but it quickly becomes lower as you pass through;—so that from that cause and a bend in the tunnel it is twilight or almost dark in the tunnel. At the upper end where the creek enters the arch it is not 50 feet high, so that there is no grandeur or beauty belonging to this bridge, except in the approach to the lower or south end."

With such authorities as these, confirmed by various verbal reports, and in ignorance of Col. Long's account, it will readily be perceived that if the natural curiosity in Scott has suffered unjust disparagement, it was altogether unintentional and not easily avoided, and this explanation is not only due to the writer himself of the "General Desciption of Virginia," but to your candid and liberal correspondent, as well as to the public.

Your other correspondent, "Mockjack," writes as if rather in an ill humor. He selects one or two passages from that portion of the article "Virginia" which you published in the Register, and because the facts stated therein do not correspond with his own opinions, he denounces without hesitation the whole article, and seems to lament that a "currency and potency" should be imparted to it by the sanction of your name, which would not have been accorded to its own merit. In justification therefore of your favorable estimate, and not because the writer of the "General Description" has been either convinced by the statements or enlightened by the logic of your correspondent, an attempt will be made to vindicate the passages objected to—not by referring to the authority of Mr. Walsh—but to the far better evidence of those who have written and spoken from actual observation—of the hundreds it might be added, who if it were necessary, could be called on to testify to the facts stated—facts which are susceptible of perfect demonstration to any one desirous of solving the problem, and who will take the trouble to ride a few hours in any direction in the tide water district of the state. The writer will indeed throw out of view the testimony of his own observation, except so far as to disclaim the charitable excuse of ignorance which your correspondent has gratuitously framed for him, and except also for the purpose of deploring (if indeed he is deceived) the spectral illusion which has presented to his own eye in common with so many others,—pictures of barrenness and decay, where scenes of fertility and beauty are said to exist. The passage particularly objected to, is as follows: "The tide water or eastern section is in *general* low, level, sandy and unproductive, and *parts of it* exhibit almost as desolate an aspect as the pine barrens of Jersey." "Mockjack" repudiates this statement, and asserts that "there is perhaps no country in the world which contains a larger proportion of land that will repay the expense of cultivation than Eastern Virginia. "Some portions of it," he adds, "are poor, and so are some portions of Egypt and Mexico, but I rather think that the whole country included between the meridian of Richmond, (extended to Maryland and North Carolina,) and the Atlantic Ocean, would be found, on experiment, to produce much more than the same number of acres included in one body, in any other region of the state." It is worthy of remark, that although the whole controverted passage from the "General Description," is considered by your correspondent as highly objectionable and *exceedingly wonderful*, all his observations appear to be directed against the solitary word "*unproductive.*" He does not assert in positive terms that the tide-water section is otherwise than *generally low, level* and *sandy*, except indeed so far as the terms themselves may be considered as discriptive of an unfertile region. He regards productiveness and fertility as predominant features in the landscape, and the barren portions of soil as only occasional shadows, forming the exception. The writer of the impugned passage, reverses the position, and considers that the fine and productive spots are insufficient to impart the *general* character of fertility to the whole. Here then is issue joined upon a question of fact. The *mode of proof* resorted to by Mockjack, derived from certain statistical documents, will be presently noticed. Let reference be first made to a few written authorities selected from among various others, with which it would be idle to incumber your pages. Beverly, one of our earliest historians, a native of the country, and familiar with it in its state of almost primitive wildness and freshness, writes as follows: "The middle of the necks or ridges between the rivers is *generally poor*, being either a *light sand*, or a white or red clay within a thin mould." Mr. Gilmer who transvered every section of the state, is perhaps still more to the point. "The state of Virginia may be divided into four zones, essentially differing from one another, but having a *character constant in each.* The first extending from the sea coast to the termination of tide-water at Fredericksburg, Richmond, &c. is *low* and *flat*, sometimes *fenny*, sometimes *sandy*, and on the margins of the rivers composed of a rich loam covered with a luxuriant and even rank vegetation."—[First Am. edition Rees' Cyclopedia. Art. Virginia.] The writer of the prize essay on Virginia agriculculture, published in the 2d number of the Farmers' Register, uses the following language: "The country below the head of tide-water, which now exhibits *so many forests of young pines*, and so many *deserted fields* of *broomsedge and briers*, was the first settled part of the state, and bears more of the destroying works of man than any other portion." Again—"The newly discovered quantity and value of our marl resources, seem to favor the hope, that from this source alone, a marked change will soon take place in the appearance of this *most tattered* and *desolate looking* portion of Virginia."

But it would be needless to multiply authorities on this subject when the testimony of hundreds of daily eye-witnesses might be safely appealed to, for abundant confirmation. It remains therefore to consider the conclusions which your correspondent has drawn from the tables of population and revenue. If the proposition maintained by him be correctly understood, it is this. If the tide water district sustains an equal population, and yields an equal amount of taxation with any other part of the state, in proportion to its territorial extent, it

is proof of its equal fertility and productiveness. To reduce the proposition to a form more simple, let it be stated as follows: If two tracts of land each containing 100 acres, support each of them 10 persons, and yield each of them 20 dollars to the state treasury,—*it follows as a necessary consequence*, according to our correspondent, *that both are of equal fertility and productiveness !*—Now to a plain and unsophisticated mind, no conclusion can be more illogical than this. Before it can receive our assent, it must be shown in the first place, that there is a fixed and necessary relation between the amount of taxes drawn from a given district, and the value of its agricultural products; and in the second place, that there is the same necessary relation between the quantum of taxation and the number of inhabitants. In other words, does not the following *reductio ad absurdum*, flow from the proposition, that so long as the population could be kept down by emigration or other cause to its present point, or so long as the existing rate of taxation should continue in the tide water district, the highest efforts of industry could not improve the soil!—The truth is, that all such reasoning is founded upon false premises, and is therefore fallacious. The same rate of taxation may draw from an impoverished and unproductive district of country, an amount equal to what is paid by one of the same extent and population but of much superior fertility. No system of taxation, not founded upon actual income, can constitute a just criterion of productiveness. The slave whose labor barely defrays the cost of clothing and subsistence, yields an equal tax to the treasury with one who rewards his owner by a handsome profit beyond his expenses.

If the proposition of "Mockjack" be true, that "no country in the world contains a larger proportion of land that will repay the expense of cultivation than Eastern Virginia,"—why is it that the stream of emigration has flowed so unceasingly from that quarter to other regions?—that the march of its population is in a declining ratio when compared with other districts of the state, to say nothing of other portions of the United States? If the poor ridges and pine barrens of the tide water district, repay so easily the cost of cultivation, why is it that we hear such frequent complaints even from the proprietors of the rich river margins?—And even if the bare cost of cultivation be generally repaid, is that sufficient to reward the toils of the laborer?—The fact is, that that portion of our state would probably have been long since nearly depopulated, if the profits of agriculture had been the sole dependence of its people. Its unrivalled commercial facilities,—its abundance of fish and fowl, and even of forest game (restored to its primeval haunts) have materially compensated for the scanty returns of labor. Even the pine fields, in latter years, by supplying fuel to steam boats, have proved a source of no inconsiderable emolument. In this general view, the rich low grounds of Gloucester and Matthews, and the fertile borders of rivers and creeks, are of course not comprehended; but these ought no more to determine the character of the whole district, than that the fine Falls plantation which is in full view from our capital, ought to furnish a standard for estimating the county of Chesterfield.

But your correspondent has quoted another passage in which he supposes that the "prejudices of the contributor to the Encyclopedia," are more fully developed. In this passage the old and destructive practice of clearing and cultivating land by the three shift system, is briefly noticed and represented as still prevailing in eastern Virginia. Does "Mockjack" deny the fact?—If he does,—the attempt to convince him would be fruitless. Of the destructive character of that system, even on the rich James river lands, he need only be referred to the letter of Mr. Hill Carter in the 3d number of the Farmers' Register (p. 132). That accomplished farmer, found his fine estate dwindling to insignificance under the pernicious operation of that system; and it was only by improved management, that its fertility and productiveness were restored. Even the skill and preseverance of Mr. Carter might have been baffled, if his patrimonial estate had been placed in the forests of Charles City.

In conclusion—the author of the "General Description" has no prejudices which were likely to mislead him in relation to lower Virginia. On the contrary, he cherishes towards it all that veneration and respect inspired by the place of his nativity; and even the pine forests in which he rambled in boyhood are still hallowed in his recollection.

J. E. H.

HINTS ON MARLING, AND MANAGEMENT OF HORSES.

To the Editor of the Farmers' Register.

Many years past I read a piece written by you, in the American Farmer, on the use of marl, but its importance never presented itself to my mind forcibly enough to induce me to use it, before I heard you had published an "Essay on Calcareous Manures." I then re-examined your piece and the writings of others that had written on the use of lime, and commenced marling a few days before I saw your essay.

I had long known of three beds of marl upon a farm I own, and wishing to examine for more, an inquiry was made of such of my acquaintances as it was thought most likely could give some information, how an auger should be made to bore for marl; but being unable to obtain the least information, a trial was made to get one from Richmond, which proved ineffectual. Finding I should have to make one for myself, the idea suggested itself to my mind that a common barrel inch auger would do, by grinding off the end in the shape of a gouge; but on trial it was found the earth slipped out of the barrel as it was pulled up: the barrel was then measured and found to be rather larger at bottom than at top. An auger was then made with the barrel rather smaller at bottom than at top, so as to prevent the earth from slipping, out, and found to answer very well in most soils. The three first augers made were inch augers, and three, six and nine feet in length, so as to follow each other, but on trial they were not found to answer well. Being of the same size they were inconvenient to get in and out. The length of the first answered, as the earth was soft near the surface, but three feet for the handle of either of the others above ground was found laborious to begin with. They were therefore altered: the size of the first remained 1 inch, the second rather smaller, and the third still smaller, the lengths 3, 5½ and 8 feet, which answered much better. The length of the barrel should be from three to four inches, the

back about one eighth of an inch thick, but thinner on the sides and near the end, the rod should be made of round rod iron half an inch in diameter. One dollar will purchase as much round rod iron as will make the three augers: the cost of making will probably be about one dollar. The iron, when the augers are no longer wanting, will be worth about one dollar. We use three augers to look for marl, but keep longer ones at the pit to bore through and through a bed before a pit is dug, for fear of losing time and labor. In some soils considerable labor is required to bore, in others but little. We have found a good many beds, by boring, that had never been known before.

We had never marled before last winter, nor seen any marl; and had every thing to learn.—We soon found we wanted a pump, but what size we did not know. One was ordered, but proved too large: another was ordered to be made as light as possible with an inch and a half bore, and to have an iron band at the lower end as well as at the top and middle, to prevent its splitting from drying when out of the water. This was found to answer very well. We commenced digging marl with grubbing hoes, which was found tedious and laborious: we then made grubbing hoes or picks, with blades only two inches wide: with these the laborers were greatly pleased, and said the labor was not half as great. Another thing required attention. The laborers threw the marl out of the pit with hoes and spades, as the carts could not conveniently descend into the pit: the hoe was tedious, and the spade required stooping, which was painful and laborious, to obviate which socket shovels were obtained, and handles got from the woods of the size and form supposed most suitable, with some of which the laborers were pleased, but it was evident there was room for great improvement. A pattern was therefore made and taken to the woods, and a suitable tree selected: the handles were then sawed out four and a half feet in length and about the size of a weeding hoe handle, but rather larger one way than the other, and dressed off rather of an oval form like the handle of an axe, or grubbing hoe, to prevent their turning in the hand: thus made and properly put into the socket the laborer consults his own ease, and throws in any direction that suits his convenience, and frequently, directly over head. In using it, the left foot comes within about a foot of the shovel, the handle passes by the left knee and about eight inches above the right knee. Probably the most convenient way to make a pattern to get the handles by, is to take a thin piece of plank four and a half feet long, and five inches wide, and to lay the shovel on the back with the socket end a little elevated, and to cut the plank to fit the socket, which will take in length six inches. When fitted, cut the superfluous plank on the upper side away in a circular manner from the socket to near the left knee; at the left knee, none is to be taken off on the upper side, but all from the under side in a circular manner; then from about the left knee on the upper side take it off to the lower corner of the upper end, in a circular manner.

While these improvements for the relief of the laborers were going on, the oxen were suffering greatly. The cart bodies were too large and heavy, and the oxen were frequently overloaded; to obviate which, bodies were made of light timber to hold about fifteen bushels. But we were at a great loss how to fix the body conveniently to keep it from being thrown off in turning up, as it was too short to rest on the ground, but at last a simple plan answered exactly. A two inch hole was cut through the cart axle, and a little piece of timber put into the hole to strike the middle sill of the cart, and so fixed as to slip in and out at pleasure.

We marled during the winter about one hundred acres of land, 250 bushels to the acre, in strength from $\frac{50}{100}$ to $\frac{60}{100}$ of carbonate of lime.—The marl used was of the large white shell, imbedded in what is called blue clay, but more properly a mixture of fine blue sand and clay. We have a good deal of "little shell" marl, which is in strength only about half that of the large shell. I am not sure that drying and weighing marl before analyzing, is that perfect way of knowing its calcareous value for agricultural purposes as is generally supposed: for marl is carried from the bed in the state it is there found, and there is no earth below the surface perfectly dry. Given weights of earth from different soils, when wet, vary very widely after drying. We see in our branches, sand that loses but little by drying, and along side, we see earth thrown out of our ditches, that was heavy like the sand, but when dry, is as light as ashes. Evaporation makes this important difference. I should therefore suppose marl containing the most calcareous earth in proportion to its weight at the bed, to be the most profitable; and not the one giving the most, when analyzed, in proportion to its dry weight. For example, say there are two beds of marl, one as it is dug from the bed, contains, in one hundred parts, of lime $\frac{25}{100}$, of sand $\frac{50}{100}$, of water $\frac{25}{100}$; the other bed is of lime $\frac{25}{100}$, of earth when dry almost as light as ashes $\frac{25}{100}$, of water $\frac{50}{100}$; these two beds as far as respects the calcareous matter are the same, and whether $\frac{50}{100}$ of sand or $\frac{50}{100}$ of water be carried out is immaterial. But how different would be the result if analyzed: one would lose $\frac{25}{100}$ of water by evaporation, the other would lose $\frac{50}{100}$ of water by evaporation. The balance, in one case, would be $\frac{1}{3}$ lime, the other $\frac{1}{2}$—instead of both being the same and that only $\frac{1}{4}$. Not many days ago I received some marl from an adjoining county which I think would have been by analysis $\frac{80}{100}$ by first drying it; but I doubt, from the soil it was imbedded in, whether it would have reached $\frac{40}{100}$ as taken from the bed. I have analyzed a good deal of marl (without an apparatus, but) agreeably to the directions given in your "Essay on Calcareous Manures," and I find from good beds of marl, samples can be selected to show by analysis almost any thing.

It was not my intention when I began this communication to write one-tenth as much as I have—however, I will merely touch one or two other subjects. While writing this letter, my attention was arrested by a person calling to another to run and prevent a horse from breaking his bridle, that he had just been tied by. I will therefore state how I broke a valuable mare from that habit a few years ago. I came home one day and tied her, and had scarcely reached my door before she broke a new bridle into three parts, and ran off. I ordered her to be brought back, and after some reflection, I cut a piece of leather about four inches long and about as wide as the head stall, and drove two

rows of small nails through: while this was fixing, I ordered a small pad to be made about the size of the leather, and filled it with wool; I then pressed the points of the nails into the pad, and put the leather under the head stall, and walked off. She gave a sudden jerk to clear herself from the bridle, which forced the nails through the pad into her head, after which she made one or two slight efforts, and stood still. I then took a horsewhip and gave her several cuts, but she would not break away: she appeared more afraid of the nails coming in contact with her head than she was of the whip. After this, when I tied her, for two or three times, I slipped the pad and leather under the head stall, which effectually broke her: and since I have broken another in the same way. Both of these were young beginners; but I imagine that old offenders can be broken in the same way. This can be used to make a horse lead into a place or pass a fence or ditch which otherwise he would be unwilling to do.

As it is now the time for getting out wheat, and all have not wheat machines, a remark on that subject may be not out of season. I am inclined to believe that horses are frequently seriously injured in treading wheat by coupling them together by the mouth, they are continually jerking each other. Mason in his "Farrier" says "a rider who is compelled to perform a long journey in haste and with certainty, in a given time, should be extremely particular in his manner of riding. He should bear lightly and steadily on his bridle and stirrups, never jerking, checking or stopping his horse suddenly, or change his gaits too frequently; all these things have a tendency to weaken and fatigue a horse extremely." This can be obviated in a very great degree by throwing the bridle of the second horse over the neck of the first, and the bridle of the third horse over the neck of the second, and so on: then with a rein attached to the bit of the first horse, the driver can stand in the middle of the ring, and drive around. Thus fixed, a small boy has more command over his horses, than a man has, when they are coupled mouth to mouth: but I should not suppose more than two horses ought to run abreast. Running four abreast to save the labor of a hand, is like calculating present profit, without regard to future loss. The last time I saw four horses running abreast, they were coupled mouth to mouth, they were jerking each other, and throwing their heads in every direction, their mouths were frequently suddenly thrown open and the slaver thrown from their knees to their eyes; and though it was early in the day, they appeared quite exhausted. Had they been fixed as here recommended, I have no doubt at that early hour, they would have been running fresh and strong.

EDMUND F. NOEL.

Essex county, July, 1833.

The minuteness of detail in the foregoing communication is especially worthy of notice, and of imitation. Descriptions and instructions on agricultural subjects, cannot be made too plain—and for want of enough minuteness and fulness of detail, many valuable pieces lose half their value. The oldest marler may gain some useful hint from Mr. Noel's observations, and the inexperienced, much more. Every fact learned by experience, by which even a little labor may be saved, or a small loss avoided, is worth being communicated, and will be both acceptable and valuable to our readers.

We presume that Mr. N. does not question the correctness of the result obtained from the analysis of any particular specimen of marl, when he states (and very truly) that analysis does not show its true strength, as it is carried from the pit to the field. The degree of wetness should not only be considered, but also several other circumstances, which greatly affect the value of marl as manure. Large shells—hard shells—stony (though calcareous) lumps, not capable of being reduced by the action of frost, &c., all manifestly cause the manure to be less operative, than when no such objections exist, and there is the same proportion of carbonate of lime, in a finely divided state. But still, the only foundation on which to erect a correct estimate of the value of a body of marl, is to learn, by analyzing fair samples, the actual calcareous contents: and then all other matters affecting value and early operation, may be estimated with sufficient accuracy.—ED. FAR. REG.

STAGE HORSES—NARROW LEAF DOCK, &c.

Lewisburg, Va., 7th month 27th, 1833.

FRIEND RUFFIN—I have read with satisfaction the two first Nos. of thy Farmers' Register, and requested our mutual friend Edward Cunliff, to direct thee to forward the Register regularly to me, which thou wilt please to have done.

I contemplate, or I should rather say design, to contribute my "mite" in communications for the "Register," influenced by the impression, that the most humble can afford some aid in accomplishing what it is the purpose of thy paper to effect; and I feel assured that the Register will effect much good as an assistant to the farmer, particularly the farmer of poor old exhausted, neglected Virginia. It will give to us a medium through which the experiments and experience of all, from the Taylors and Meades of the state, down to thy humble servant, can be furnished for our information.

I shall act upon thy suggestion, and sign my name to the pieces I forward for publication.

Stage horses.—In thy second No., I read with some interest an account of the "*English coach horse.*" From this, I am satisfied we have in this section of country a superior strain of horses for stage coaches, to those referred to in England—to prove which, I will give the result of my experience in comparison with the rate of performance of the English horse.

The English horse, (says the extract in thy Register, from the Quarterly Review,) is required to run "*ten miles in one hour per day, resting every fourth day, the whole day.*" This is exacted of him on good McAdamized roads, nearly level, and he sustains this labor on an "*average for four years,*" in which time he would have travelled 10,860 miles.

Some time past, I saw published an account of a "*real Vermonter,*" that had in six years and six months performed the astonishing travel of 17,000 miles, and he was then regarded as "*a good old horse.*" This about equals the performance of the English horse.

Now, I have at this time in my possession, a horse, raised by Charles Arbuckle of this county, that I ran for seven years on a route of upwards of eighteen miles, six times a week, and often seven

times; and if he lost any time I cannot recollect it, and it is not possible that all his lost time could have amounted to his seventh trip, which would have made him to have travelled in "*six years and six months a distance above* 36,500 *miles.*" I sold to William Smith, stage proprietor, more than a dozen horses that had in my service performed more than 17,000 miles, several of whom, after having travelled half that distance, he sold for upwards of $100 each.

The average of time my horses do me good service is not short of six years.

It is true, a great difference is produced often by the distance per day at the rate of which a horse is required to travel; but when we take it into consideration the rough hilly roads in this section, and the first rate roads of Great Britain, there is as much labor exacted and obtained here, as in England, of the horse. And where our roads are good, our horses perform their stage in as quick a time: for instance, between Lewisburg and the White Sulphur Spring, a distance above nine miles, has been, by the teams of Messrs. Porter and Belden, Smith, Shanks and my own, travelled within fifty four minutes: and they could have gone within the hour with great ease, the full ten miles, and in doing this, would certainly be less worsted than they would be over the other parts of their routes at the rate of five miles the hour.

The Greenbrier horse is remarkable for his small leg (below the knee) and foot, and for his "*bottom*" and muscle. The climate and country have done all for him: little pains having as yet been taken to avail ourselves of your Sir Archies, Charleses, Henries, or Eclipses, a cross from which I am confident would give an improvement greater than in many other sections of this union. Grass, the natural food for the horse, grows here to great perfection, and he seldom gets any thing else until he is three years old; and then he is generally fed with grain, because his owner cannot spare the time for him to feed on grass: but many fine horses live long and never taste of grain.

Leap of a Greenbrier filly.—I have a mare, raised by A. Rogers, of this county, got by one of the half blooded horses of Old Virginia; in running, mounted by a light rider, who, at starting, saw nothing to obstruct his course, but when at full speed, discovered a wagon with a body eighteen inches high meeting him, the driver of which, to avoid him, left the track he was in; at the same time, my son with the motive changed his course: the consequence was, the wagon was at a right angle across the track of the mare, who, unable to avoid it, leaped over it, clearing the wagon; and from her toe marks where she started, to the impressions made by her hind heel, a distance of twenty feet eleven inches intervened, and this up an acclivity of at least one degree.

Narrow leafed dock, a fertilizer of land.—Dock has, so far as my experience extends, been regarded as a nuisance to land, and all good farmers were required to wage constant war against it; and perhaps it is right that they should be vigilant in its extirpation from other crops: but I am satisfied we have not under our control a more powerful restorer of worn out land.

In a piece of my meadow, I discovered a large portion of dock, and to prevent its taking entire possession of it, I had all the stems pulled up before I thought they were ripe; but in this I was mistaken, for I afterwards discovered that the ground upon which they were deposited (a poor sandy worn out bottom, that would not bring me the seed of any thing I had put in it,) sent up a most tremendous crop of docks, which I had mowed down rather earlier than I had them pulled up the year previous, and while they were much greener: but I was again disappointed, for the seed had matured more than I had supposed, and another bountiful crop was the result. Next spring and summer, to prevent the dock from spreading, I ploughed the ground three times, turning under the green dock which killed all effectually: I spread lightly some timothy hay upon this spot in August, and this month I obtained from this spot which I regarded as worthless, the heaviest crop of grass I ever saw cut. This suggests this query—would not dock be a powerful assistant in restoring the exhausted bottoms of eastern Virginia? Its long and wide spreading roots would, I am conscious, bring the strength from below, where our best ploughs reach, and deposite it on the surface; it produces a large quantity of seed, which is easily collected; and dock is quite easily conquered, if taken in any stage previous to its blossoming, but afterwards it cannot be managed well.

Lucerne.—Canst thou inform me through thy "Register" or induce some of its correspondents to do it, whether this grass has succeeded in Virginia? and if so, the nature of the soil most favorable to its production.

Thy friend,

J. F. CARDWELL.

For the Farmers' Register.

THE ADVANTAGES AND DEFECTS OF AGRICULTURAL SOCIETIES.

Several suggestions have lately appeared in the Farmers' Register of the necessity of forming societies to promote the improvement of agriculture, which, added to other more private indications, induce me to believe that the establishment of such societies will soon be recommended in Virginia. No one is more thoroughly satisfied than myself of the great advantages that may be derived from agricultural societies under proper regulations—but as they have usually been managed, they have been of but little use to agricultural improvement, if not of actual detriment. If any means are brought forward with great pretensions and parade to effect a certain object, and fail manifestly, the trial is very apt to retard the end intended to be thereby forwarded. As a sincere and zealous advocate for the improvement of agriculture, and of associations to promote that object, I will frankly state some of the reasons why so little good has been yet effected by such means in the state of Virginia. My representations will not be useless, if they have the least tendency to prevent similar errors hereafter.

From 1819 to 1822, there was a *rage* for forming agricultural societies in Virginia. Nearly all ran the same course, and in a few years ceased to be heard of. The faults which led to these results were so uniform, that a general statement may appear for (what certainty I do not intend) a description of, or a satire upon, some particular society. I mean to remark on general, and not on individual or particular cases of action, or of character.

A remarkable and notorious characteristic of Virginians, is to commence the support of any good and popular scheme with vehement and overflowing zeal—and having thus wasted our energy in the outset, to become weary, relax our exertions, and finally cease entirely to make them by the time they are most wanting. Yet perhaps the deliberate judgment of each individual is as much in favor of the object when he thus abandons its support, as when he first undertook, and gave all his strength, to commence the operation. We act more from feeling than from reasoning. We start forward to aid a good cause, as most of us would rush to a joyous festival, and when the excitement of pleasure is over, we as readily yield to the reaction of feeling—the wearisomeness and lassitude which always follow the pursuit and enjoyment of mere pleasure.

But besides this our national failing, which unfortunately affects all our public institutions, there are other evils which press particularly on agricultural societies, and are sufficient to destroy first their usefulness, and next their very existence.

When the formation of an agricultural society is first proposed there are plenty of members to be obtained. Each is willing to give his name to support the scheme; and he is willing also to add a little of his time and a small contribution in money. But very few think of becoming *working members*, or of doing any thing as individual cultivators of the soil to aid the object of the association. They meet at the stated times for one or two years—find that they have no communications to hear—each thinks or declares that the society is useless, and wonders that it should be so—and finally, (and necessarily,) it sinks into contempt and dies, without even the little respect of a vote being taken for its dissolution. Of all these perfectly useless members, there may be scarcely one who might not have rendered some service, by making experiments or observations, and reporting the results; yet each one is kept silent and useless by false shame, and the fear (if he should make the attempt) of not being *distinguished* as an agricultural writer.

So much for the mass of private members. Next let us look to the officers, on whom much more depends, to secure the usefulness and permanency of the society.

When a society is first formed, one of the most aged, respectable, intelligent and popular members will of course be made the presiding and first executive officer, on whose zeal and energy the success of the scheme must mainly depend. Such a man will generally be justly entitled to the love and esteem of his fellow members—perhaps he will stand equally high as a farmer, or as a man of general and valuable acquirements. But if he wants zeal and energy, (as must be expected of most old men,) the highest other qualities will not make up for these deficiencies. After such an appointment, the high respectability and popularity of the individual forbid a change—and if he should prove an inefficient president, the society is soon *overlaid* and destroyed by his worth and dignity. The same observations apply, but with less force, to all the other subordinate officers of a society.

To avoid these causes of danger to new societies, I will respectfully propose to those who may be their founders, a few innovations which I think will be found of use.

1. Let the society be composed altogether of *working members*: and to be sure of that object, let no member be admitted, except he previously presents some report in writing, (however concise, or no matter how trivial the subject,) of experiments made, or facts observed. Scientific and professional men, in their departments, could perform similar duties. Such a form of initiation would compel every member "to break the ice;" and generally nothing more is wanting to prove to them that they can do good service in this way to agriculture, and with credit to themselves. Let these reports which would be presented as claims for admission, be always plain, simple and short, and in manner and form not beyond the imitation of any plain practical farmer. It would also be proper to require afterwards of each member a small but certain amount of *working* service every year—as, for example, the making and reporting of one or more experiments on some doubtful point in farming, or in any art or science connected with agricultural improvement. I do not mean to discourage the more general, speculative, and argumentative essays which have heretofore formed nearly all the communications to agricultural societies; but these might be safely left to be performed as voluntary duties.

It may be objected that but few members would be obtained, if such preliminary and regular duties were required. I think otherwise. Very few would object to write in the manner proposed, if it was made a duty, instead of being altogether voluntary, and if the performance was required of all without exception. But even if only ten members would unite on these terms, they would be more useful, and do more credit to themselves, than they could with one hundred more on the ordinary plan.

2. Let the duties of officers be so fixed and defined, as that the performance should be as little as possible affected by their individual characters and habits—and by a fixed rule require rotation in office, so that no officer shall serve two years in succession. Almost any member, who has zeal and activity, may fill well any office in a society—and a year's service would be sufficient to show in any a deficiency in those indispensable qualifications.

If societies on something like this general plan were spread through Virginia, incalculable benefit to agriculture would be derived from thus instituting, accurately observing, reporting and publishing hundreds of experiments, and ascertaining numerous important facts, which can be made known in no other way. If only twenty individuals, composing a society, would make so small a sacrifice as the duties would require, in as many as twenty different counties—and means were adopted to interchange communications, the result would be that each member would have the benefit of the labor of four hundred experimenters and recorders of agricultural facts, or scientific observations. Is not this an object worth seeking, and worth *working* to obtain? But if the plan was properly estimated, there might be ten thousand persons so operating, and they, and all the farmers of the commonwealth, enjoying all the benefit to be derived from combining all these many exertions of labor and intellect.

AN EX-MEMBER.

July 24, 1833.

For the Farmers' Register.

FALLOW—ITS VARIOUS AND CONTRADICTORY SIGNIFICATIONS.

One of the many requisites for advancing the improvement of agriculture, is a correct *nomenclature*, in which respect, no other science or art is so deficient. There are few terms used in agriculture which are of universal acceptation, and many of them are used in senses so different, as to cause the written instructions given by one farmer to be unintelligible to most others. And these objections do not apply merely to the hundreds (if not thousands) of provincial terms used by unlettered cultivators; for they are found more or less to apply to the most correct and well informed authors. Indeed it cannot well be otherwise. Almost every term used in agriculture was at first *provincial*, or limited in its application to the practice of some particular district—and but few have been so extended as to be universally recognized in a single sense. If there should ever exist a general system of correspondence and concert among the agriculturists of the United States, one of the first operations ought certainly to be the adoption of some common signification of common agricultural terms.

But great as is this evil in our country, it is much worse when we take a view of British agricultural books, and compare their terms with our own. Many passages (from the use of terms to us unknown,) are as unintelligible to us as if written in some foreign language.

The word *fallow*, is remarkable for its various meanings, which is the more remarkable, because much controversy has been carried on in England, and also in this country, as to the good and evil tendency of fallows. Some have continued to dispute on this question, after they had lost completely its original meaning: and have adduced the authority of some preceding and older partizan, as of their side, when, if opinions had been considered instead of names, they would have been found entirely opposed; as in questions of party politics, the terms, however perverted, are every thing, and their true meaning is nothing.

The term *fallow*, applied to land, originally meant its lying untilled, and unproductive, or (according to *our* provincial term) at rest. When such land was ploughed up, during the old and very imperfect practices of husbandry in Europe, it was always done to be laid down in grain sown broadcast, and most generally in wheat. As the process of preparation was performed with as little trouble as possible, it was of course commenced late, so as not very long to precede the sowing, and was limited to as few ploughings as would form a tolerable seed bed. This *wheat on fallow* we may suppose led to *fallowed wheat* as an equivalent term, and thence came the use of *fallow* to designate the ploughing or preparation of the land for the crop. Here were two totally different meanings, and the last evidently improper, if the first was correct. The first (and still most general) application of the word *fallow*, was to land not ploughed, or in use—while the new meaning was directly the reverse, or land *ploughed* and preparing for a crop.

As cultivation was improved, fallow (in its second meaning) became a very perfect and laborious operation, extending through the greater part of the year, and serving not only to put the soil in proper tilth to receive seed, but to cleanse it by the destruction of all noxious weeds, which had now become the main object of fallow. The original meaning was now quite lost (in agricultural language, however it might stand in dictionaries)—for though the land was still unproductive, it was any thing but neglected, uncultivated, or at rest.

The increase of skill and labor bestowed on this operation rendered it so different from the ancient practice, and from such as still remains in the worst cultivated countries, that we may consider it as a third meaning for fallow: for, according to the manner of the process, fallow was the pride of Scottish and English husbandry, while it was the disgrace of the French, where the ancient slovenly manner long continued, and perhaps still continues.

But as fallow was a preparation for wheat, when other horse-hoed and cleansing crops were afterwards introduced, and made to precede, and prepare the land for wheat, their cultivation was also designated by the same term—and the two kinds were distinguished by the names of *naked* or *summer fallow*, and *covered*, or fallow with a crop.

It was after this that arose the long continued controversy in Great Britain, between the advocates of naked summer fallow, and those who were for substituting it by covered fallow—or as they were called, *fallowists*, and *anti-fallowists*. The former maintained the high importance of cleaning the soil of weeds, and that it could only be done by a good naked summer fallow. The latter admitted the necessity of the cleansing process, but maintained that it might be performed sufficiently well, while cultivating some profitable crop, without losing a whole year of rent or product, as the naked fallow required. This was an important consideration, where the price and rent of land were so high: and the whole dispute in Britain turned on the loss of a year's rent, and whether that loss was compensated by the superior condition of the field from using naked summer fallow. The opposer of naked fallows admitted their good effects, while he contended that they were too dearly paid for by the loss of a crop, or of a year's rent: and their strongest advocate admitted that a covered (or crop) fallow would be preferable, provided it would leave the field as clean, and in as productive a state—which the fallowist denied could be the case.

I will here observe that the great objection, in Britain, to covered fallowing for wheat, was that they had no horse-hoed, or cleaning crop, which could be profitably cultivated on a large scale, and which ripened just before the time to sow wheat. If their climate, like ours, had been suitable to Indian corn and tobacco, these would have been considered fallow crops of such great value, as to serve as a general substitute for naked fallows. Yet in this country, where these two crops have so generally preceded wheat, we have never called their cultivation *fallowing*, merely because it had not been so named in England. Yet strict analogy directs that term to be applied to these crops, if beans are entitled to it in England. We have here also on every farm, fields lying at rest, and unproductive, for one or two years between the years of tillage. Such fields are fallow, according to the most ancient, general, and most correct meaning of the term: yet in no case has this application ever been made, because the next suc-

ceeding crop was to be corn—and therefore we could not borrow a term from England, for a practice and cultivation not known there.

The laborious and expensive English summer fallow has been seldom if ever tried in this country, because our cheap land and dear labor would have made the practice too costly, even if our common cleansing crops did not render it unnecessary. But though we have no like operation to call summer fallowing, we have applied the term to another preparation for wheat, which is quite different, and which is never called by that name in England: I mean *wheat on clover lay.* This is, it is true, a summer, or early autumnal ploughing, and intended to prepare the land for wheat: but its object is entirely different from the process from which we have borrowed its name. The English fallow is intended to extirpate weeds, by repeated ploughing, harrowing, rolling, raking, &c. so as to leave the land as clean as possible. By our (miscalled) fallow, we intend to turn in a coat of vegetable matter by a single deep ploughing, to enrich the land, while a seed bed is imperfectly made above, by a later shallow ploughing or harrowing. Yet, deceived by the same name being given, we do not enough keep in mind that the processes are totally different. We have even taken sides for and against fallowing for wheat, and each party has borrowed the arguments of English writers, to sustain or oppose practices, which those writers either knew nothing of, or at least did not know under our names. In thus disputing about English terms doubly misapplied, we have neglected to ascertain by discussion and experiment the comparative and absolute value of our own practices. It is yet entirely unsettled what is the comparative labor and production, and improvement or exhaustion of fertility, caused by our wheat on clover, and wheat after corn, on the different soils suitable to all three of those crops.

In lower Virginia, though we have denied the name of fallow crops to corn and tobacco, fallowing is a common term used for ploughing the land to prepare for those crops. This is the only sense in which we use the word, which has no special relation to preparing land for wheat.

The last and most strange appropriation of the term fallow is in the western part of New York to the *clearing* (or "chopping") of woodland for cultivation: not its subsequent breaking up for tillage, but merely removing the trees. As this use of the word fallow may be as strange to my readers as it was until very lately to myself, I will refer to my authority, which is an article in the Genesee Farmer of July 13, 1833, "*On clearing new lands,*" in which this application of the term fallow is several times repeated. R. N.

SKIPPERS IN BACON.

Mr. Editor,—There is a very general disposition in mankind, and in womankind too, to do things in any other way than the most direct. With many, a simple method of accomplishing an object has no charms; something of mummery and mystification is absolutely necessary to recommend a scheme to their favorable notice.

We see often in newspapers, and every year in almanacs, sage recipes for blockading smoke houses against the inroads of those destructive little animals called skippers; and how much red pepper, trash tobacco, pennyroyal, &c. have been vainly wasted for this purpose in Virginia, nobody can calculate.

For the benefit of your readers, I give you my method of prevention. It has two recommendations—simplicity and efficiency.

Smoke the meat every day, until it is smoked enough; and on the very day that the smoking is discontinued, pack it in hogsheads, barrels, or boxes: they need not be air-tight, but it is necessary to have no holes or cracks in them large enough to admit the small fly, that is the mother of skippers. A lady to whom I communicated this plan in conversation, for the sake of convenience, used bags to keep her bacon in. Skippers were found in but one of them; and in that there was a hole.

This system has succeeded perfectly with me for several years. So far as I know, it is original; but I cannot suppose that any thing so simple and so reasonable was never tried by others.

D.

To the Editor of the Farmers' Register.

It is without the permission of the fair and accomplished authoress of the "Song of the Bees," that I offer it to be placed in the "poet's corner" of your publication. This little effusion of poetic fancy, written in an hour of sorrow, may serve to cheer the weary swain, who while he imitates the industry of the bee, may not always possess its patience.

The circumstances under which these lines were written would, if known to your readers, serve to throw a charm around them, even greater than is given them by a mind that adorns whatever it touches. C.

SONG OF THE BEES.

We watch for the light of the morn to break,
And color the eastern sky
With its blended hues of saffron and lake,
Then say to each other, "Awake! Awake!
For our winter's honey is all to make,
And our bread for a long supply."

And off we hie to the hill and the dell,
To the field, to the meadow and bower,
We love in the Columbine's horn to dwell,
To dip in the lily with snow white bell,
To search the balm in its odorous cell,
The mint, and the rosemary flower.

We seek the bloom of the eglantine,
Of the painted thistle and brier,
And follow the steps of the wandering vine,
Whether it trail on the earth supine,
Or round the aspiring tree top twine
And reach for a state still higher.

While each, on the good of her sisters bent,
Is busy, and cares for all,
We hope for an evening with heart's content,
For the winter of life; without lament
That summer is gone, its hours misspent,
And the harvest is past recall.

RAKE USED IN THE VALLEY.

To the Editor of the Farmers' Register.

I herewith send, agreeably to promise, a description of the rake used in the Valley, for gleaning wheat fields. It is extracted from the familar letter of a friend, and was not designed for publication: it will not, however, be the less valuable on that account. Rakes are occasionally used

with us, four or five feet wide, with a handle and nib to draw by. The horse rake is commonly about ten feet wide. The rake described below is eight, and may, when there are no obstructions, be nine feet. When more than one are used, they should move abreast, with the ends almost touching. The relative performance of their several implements may be easily estimated, observing however, as an offset against horse rakes, that though most expeditious, they cannot, or at least should not be used when the ground is wet, that they always collect more or less dirt, and that much time is lost in turning, when the courses are short.

The gentleman who has furnished me the accompanying description is intelligent, practical, and eminently successful. He had previously used horse rakes, but decidedly prefers those which he describes.

I rejoice at your prospects as indicated by the subscription list: considering your interest *quo ad* that undertaking, as the interest of the state.

AGRICULTURE.

"The rake I use is plain and simple in its construction, and can be made by any of your rough carpenters. The head is about eight feet long, two or two and a half inches square. The holes are bored by a three quarter inch auger, three inches asunder. The teeth are of tough hickory, twelve inches long, and put in so as to be lower at the end of the teeth than at the head. Two small shafts are inserted in the head; the ends of the shafts are fastened together with a pin; a strap of leather (sometimes two) is fastened to the shafts about midway; the strap being sufficiently long to extend from each shaft and across the breast of the man, who gets between the shafts, raises them up, puts the strap (or straps) across his breast, and moves on. When the rake teeth are filled, the man lifts the rake up by the shafts or head, and proceeds; taking care always to empty the rake so as to place the wheat in a windrow, from which it is hauled to the stack yard. In putting the teeth in the rake take care so to regulate them that the teeth may not go in the ground, as the man walks along, but as near the surface of the ground as possible. On level land you may have the head nine feet long, made of dry tough wood. On such land, a man with such a rake, can easily glean ten acres a day; and the wheat will be clear of grit. I do not recollect the length of the shafts, or the distance they are inserted in the head from each other. This will be regulated by the length of the head of the rake. The shafts must meet at the end, before the rake, and of course must be made of wood that will bend."

THE MARCH OF INTELLECT AND PROGRESS OF THE KNOWLEDGE OF POLITICAL ECONOMY—IN NORTH CAROLINA.

Sir,—On reference to the proceedings of the 4th July Convention, at Raleigh, I find that a resolution to the following effect was proposed:

"*Resolved*, That the present condition of North Carolina is, in the opinion of this convention, highly discouraging and mortifying to her citizens; that here trade is languishing, her agriculture is falling into neglect, her population is forsaking her, her political strength is withering, and her public and private wealth is declining; insomuch, that if these evils are not arrested in their course, she must speedily sink into ruin and contempt; that they owe their existence mainly to a want of state pride, and concert of opinion and action, and to the difficulties of internal transportation, and the want of *primary* markets within her own bosom; and that for the remedy of these mischiefs, the active and zealous co-operative exertions of all her citizens are imperiously demanded, and they are urged to put them forth, by every consideration of public spirit and private interest; *that the improvement of our means of internal transportation, and the provision of primary marts, within the state, should constitute the first grand objects of these exertions; that in their accomplishment, they may with great propriety, invoke the aid of the state treasury; and this convention doth further believe that without free and liberal aid from that source, for the furtherance of these objects, the state of North Carolina will soon cease to have a treasury worthy of care or preservation. The convention are, however, of opinion, that whatever benefit might accrue to some of the citizens, the state, as a whole, cannot, with propriety, be asked to commit an act so suicidal as to lend her resources to the accomplishment of any work, the tendency of which would be to carry any portion of her produce for a primary market, beyond her own limits, before she has done all that she can to create such a market within them, and before proper exertions have been made to bring every section within reach of such markets.*"

However, this resolution was judiciously and adroitly rejected. A very correct substitute was proposed from a quarter which rendered its adoption a matter of peculiar satisfaction. It was a sort of *amende honorable*—a species of indirect declaration that hopes which had been formed on the coast, and denounced, more than a year ago, as likely to be fallacious, were now found to be worse than fallacious; inasmuch as much time—irredeemable time—and much good opportunity—opportunity that had passed away, and all the benefit to be derived from "taking that tide" at its turn, which leads on to fortune, for ever lost.

I would beg to say, that "if the present condition of North Carolina be highly discouraging to her citizens"—if her "population be forsaking her"—if her "political strength" (in spite of an increasing population and an augmenting representation in congress) "be declining"—if "her public and her private wealth" (a strange notion, when we recollect her total exemption from debt *and* taxes, compared with her southern neighbor—a notion more likely to proceed from some selfish and some whining grumbler, the value of whose *private* property, in some decaying town on the coast, was to be promoted at the expense of the *public* welfare) "be diminishing"—if "her trade be languishing"—if, owing to these imaginary evils, North Carolina sinks into insignificance, it rather arises from the effect of political hypochondria, than real political disease—it is *not* owing to the want of *primary (ultimate* would surely be a more suitable word,) "*markets*" within her own bosom—but, to the want of a proper spirit of exertion in the bosoms of her people and their representatives—to the want of that noble spirit of intelligence and generosity, of prudence, and of preference which, ten years ago, inspired the lamented Murphy, and intelligent Seawell, and prompted Hamilton Fulton and his (alas too few)

associates and supporters in the legislature of North Carolina, to propose the construction of a simple experimental rail road between Raleigh and Swift Creek—to the want of a spirit which, *then*, in the expenditure of $10,000, would *now* have ensured a saving to the state of $10,000,000—to the want of that liberal spirit that, *in the first instance*, had employed an enigneer, who had formed docks in Bermuda, for his own government, and constructed canals for that of Sweden—all of them proving, after a lapse of fifteen years, monuments of his real and practical ability; and, *in the last instance*, yielding to a feeling of a totally opposite character, reducing him to a rank lower than that of the lowest surveyor in the United States, voting him a *per diem* allowance of one dollar and a half for his expenses—and this at the very moment when there was not a county court lawyer in the legislature, thus exercising the privilege of estimating tried talents, proved intelligence, and evident experience, that would not have spurned a five fold remuneration for a day's exercise of his professional verbosity, and the application of the sublime chicane of the common law.

But "*primary markets*"—this is the slang—as though Ohio, Michigan, Illinois, Indiana, Kentucky, Tennessee and Mississippi—all sections of the United States in the most flourishing condition, with populations hourly augmenting, an internal and external trade, both constantly increasing, and a *domestic* want incessantly calling for a larger and larger supply—as though these states were constantly sinking in the scale of moral and political importance—as though the official list of the tonnage of North Carolina does not, to the close observer and the accurate calculator in political arithmetic, clearly demonstrate the relative *superiority* of North Carolina over either Virginia, South Carolina, or (excluding Charleston and New Orleans,) all the ports *between* Charleston and New Orleans—as though, (if to illustrate our ideas and prove their correctness, we may be permitted to cross the Alantic,) Bavaria and Austria, and especially the latter, with her numerous provinces, alike distinguished by the wealth, hospitality and generosity of her nobility, and the happiness and comfort of her peasantry, for the small comparative amount of her expenses, the high value of her money, and her successful progress in manufacture, agriculture and domestic improvement, and of course, her uniform progress in national wealth and national power—as though these powers were *essentially* inferior to Holland and the Hanse towns, because, forsooth, the latter were the great shipping ports or "*primary markets*" of Germany—as though Munich and Vienna were inferior to Venice and Trieste, because the latter were the "*primary markets*" of the Austrian dominions—as though France and Italy, which, when their population is contrasted with that of Great Britain and her dependencies, have, comparatively, no external commerce, do not possess an equivalent mass of political power and influence, and of national wealth—as though Great Britain limited to five foreign trade ports, France to four, Spain to two—as though all these countries would be better off, if each county, department and province had a "*primary port*"—in fine, as though North Carolina had better, in those ports and on that coast "*where the genius of the tempest has fixed his abode*"—in ports towards even which no large ships dare to approach, and on a coast which, time immemorial, has been a source of terror and apprehension to the weather-beaten tar—as though North Carolina had better erect ports here for small craft, which will merely contribute to the sustenance of the never-satisfied and ever-craving maw of the master city, New York, that Babylon of the western hemisphere, than endeavor to elevate Norfolk to the character of a "*primary market*," and its own "*primary*" and justly merited importance.

Let not the reader, sir, say "this is all declamation"—*nature has denied to North Carolina the power if having a port, even if commercial arrangements and local circumstances would seek to do so*—this the experience of two centuries fully and clearly demonstrates.

However, it is time to stop this strain of indignant invective—indignant, because a feeling arising, *partially*, from personal inspection, and *generally*, from an accurate investigation of the subject, exists of the utter fallacy and profound ignorance of every notion which is italicised in the above paragraph; and because it is time to appeal to the returning reason of North Carolina.

Of all the acts of folly of a politically and commercially disordered intellect, there never has been one so great, as that national benefits are to be found in great cities. "Of all the advantages to be derived from rail roads," said the London Quarterly, "there will be none so great as that they will put a stop to the growth of such cities as the Babylon in which we write." The sentiment is a correct one. It is fully proved to be so by the horrible display of crime in New York and Philadelphia. Let a criminal census be taken of the city and state of New York, and another of Virginia and the Carolinas, and we shall soon see the horrible effect of crime in large cities. But of this horrible effect, we have a sufficient proof in the relative *quantum* of crime in England, and especially in its great cities—in England especially, the seat of that "perfection of reason"—*the common law*—compared with that of France—of France, that with the exception of Paris, has no large, overgrown and overgrowing city. Indeed if as a citizen of North Carolina, the alternative were offered to me of contributing to make Richmond as large as New York, and of erecting a town of the same magnitude either on the sea coast or in the centre of North Carolina, I solemnly aver, that on Richmond I would confer this supposed favor: but, Hercules with the shirt of Nessus did not feel a torture more horrible and tormenting, than would Richmond in such a predicament. Thanks to the rail road system, the existence of such a nuisance there or elsewhere is not to be feared.

However, it is time to quit this digression on a *problematical question;* although there is little doubt that the evil thus deprecated, would in the highest degree be positive, perpetual and pernicious.

The times and the progress of knowledge, the growing wants and increasing necessities, the want of properly developing her real, immense, and compared with their present developement, the almost illimitable resources—all unite to render it proper that this subject should now be urged on North Carolina, and in the plain and undissembled language of candor and of truth—to other

causes, we may add the temptations offered in the western states to immigrants, by the cheapness of the land, the unembarrassed state of its title, and the natural fertility of a new soil—the first and the last difficulties might be overcome by industry, and the more easy access the Atlantic states have to the "*primary markets;*" but, thanks to the lawyers, in the legislatures of the old states; where land is held under the grants, and law administered under the acts of William and Mary, Anne, and the three Georges, and every modern improvement studiously precluded, there is no hope of removing the former; and hence the necessity of these states patiently awaiting the ever varying decision of these legal lords, and paying their sedulous attention to apply all the means in their power to avail themselves of the advantages they so decidedly possess over the new states, as to locality; and not only as to locality, but in their naturally superior perseverance and talent in the application of all modern improvements to their now declining agriculture.

The times and the situation of the state urge it. The result of the late Raleigh convention adds to the motives that should induce every patriotic and intelligent North Carolinian to look, and to look well, to the subject; especially when he sees that the great and important counties of Anson, Buncombe, Burke, Cabarry, Caswell, Davidson, Guildford, Iredell, Lincoln, Mecklenburg, Montgomery, Person, Rockingham, Rowan, Rutherford and Stokes, *cum multis aliis*, counties, many of which now deal *almost exclusively* with Augusta, Charleston, Columbia, Camden and Cheraw—when he sees that these counties, occupying so large and important a part of the producing and consuming power of this state, did not send a member to the convention—when he sees the mild, judicious and conciliatory resolution offered as a substitute for that above quoted, by a member from the lower region of the state, evidently showing a diminution in the caloric which was in such full force when the "instructions" were given which were paraded with such pomp by the Raleigh Register—when he beholds this, he will learn the folly of longer delay; he will see, from the proceedings of the convention, the utter impossibility of precluding the formation of a rail-road from Fayette to Raleigh, and thence through Louisburg to the point on the Roanoke, where the rail-roads from Petersburg and Norfolk will unite. The low country Carolinian too will see the folly of feeding and gormandizing New York with his small craft. He will anxiously await the moment when the rail-road from Fayette to the Pee Dee shall be completed, and Norfolk with her harbors whitened with the sails of the largest merchant vessels, will not only become the port of North Carolina, but offer a market to the eastern sections of South Carolina.

It would be no wonder that such should be the resolution of previous doubts on this subject, and such the clearing of so darkened a vision, when we recollect the power and population, the influence and information, the consumption and consequence of the above named counties, which it should seem unanimously declined sending a single member to this far-famed convention. They know their wants as well as their power in the state, and the proper channel of their trade—a power which, like the influence of the departed patriots of Rome, at the funeral of Germanicus, was more sensibly felt, because Tiberius would not suffer their statues to be carried in procession. These counties, of their own accord, declined an appearance in the convention; but their influence must have been felt and acknowledged.

Some persons have strange notions of national wealth, uniformly forgetting the increasing white population of all the upper, and a great portion of the middle sections of North Carolina—continually forgetting the complete dependence of Charleston and Georgetown, Beaufort and Savannah, on the small Atlantic ports of North Carolina—equally forgetful of the dependence of Cheraw, Camden, Columbia and Augusta on her western and midland counties, for wheat, corn, flour, &c. &c. they imagine North Carolina to be sinking in the scale of national importance—and this "vain imagination" arises, *in the one instance*, from a want of attention to the value of the produce exported; and, *in the other*, from the impossibility of forming an accurate estimate of its amount. It also arises from the utter ignorance or misapprehension of the fact, that the sale of $100 worth of provisions is equal to the sale of an infinitely larger amount of cotton, perhaps a two fold amount—also, continually forgetting that the total of the United States Bank exchange transportations at Fayette, with its comparatively little business, was $4,850,553 34; when that of Charleston did not exceed $7,005,639 89—that of Savannah being $10,024,026 88—and of New Orleans only $16,838,598 51—the three latter ports exporting to the amount of $21,000,000 in cotton alone, besides the vast mass of other produce finding its way down the Mississippi—equally forgetting that North Carolina has been able to close a bank, and withdraw a large portion of its paper circulation, and that under this pressure, her land bears a higher price than that in Georgia and South Carolina—totally unmindful of the reports of her tax lists, the citizens of North Carolina proclaim, that because she has no large importing or exporting port, she does not occupy the rank she ought to do in the Union.

What would have been the case if the colonial minister of the crown had fixed the present southern boundary of North Carolina as that of Virginia. Would the mere want of a "*primary market*" in the *present* separate state, have been a legitimate cause of separation, and must not Norfolk have then become the port of North Carolina, called as it would have been, Virginia?

The saving in government (this is said deliberately and advisedly,) would only have been equalled by the political and moral influence gained by such a combination; and well would it be for the south, if the Virginia of 1833 was the Virginia of Charles the 2d.

But as it is, the boundary line, and the consequently ambitious spirit of sectional pride, cannot alter the state of things. The mandates of sovereigns cannot create moral and commercial boundaries, and force trade into unnatural channels. Hence the shallow artifice of appealing to the sectional pride and the proud passions of a people, instead of to their reason and right feeling, must, in this instance, as in all others, fail. Petersburg and Richmond must become the depots, and Norfolk the port of import and export—in short, the "*primary market*" not only of North Carolina, but of the eastern sections of South Carolina—

eventually of the west and south west; and thus, with Baltimore and Philadelphia, offering some counterpoise to the "empire state."*

But is there no cause for this extraordinary feeling on the part of North Carolina toward Virginia? There is much; and it is to be found in the injudicious conduct of Virginia, her citizens and her institutions. Much of it is to be traced to the dead set made by her banks, against the banks, and consequently the trade, of North Carolina. This sort of conduct, however it may have been authorised by the foolish and forcing system, once adopted by the bank of North Carolina, is now no longer to be justified. The interest of both states would be improved *if the banks of Virginia were to receive North Carolina paper at par.* If they ask where they are to obtain the discount, or difference in value, it may be replied that the mere declaration at Richmond, &c. to such an effect, would go far to remove the evil—perhaps the half of it, and possibly the whole; and further, that if only one half the evil was removed, the other half of the charge might be counteracted in the purchase and sale of the commodities passing between the contracting parties.

Nor is it too bold to aver that such a measure would result in an immense benefit to Virginia—in a benefit proportionably as great as that which would result to *her* bank paper in New York or Philadelphia, if the bank of the United States and the other banks were to declare that all the notes of Virginia should be received on the same terms.

In fine, a tie would thus be formed that would render the union between North Carolina and Virginia as indissoluble as the advantage to their agriculture and their commerce would be infinite.

The policy of such a measure is especially urged at this moment, when New York is making such an effort to secure the trade of North Carolina *via* Charleston. On this subject, a unity of feeling and coincidence of idea should prevail not only among the states of Virginia and North Carolina, but, as to Norfolk, generally among the old southern states. Rapidly are the western states melting into a mass, and as rapidly are the means forming of making them morally and commercially dependent on the middle and eastern states. These means are the canals and rail roads from the Mississippi and the lakes in a north and north east direction. Of the Rideau and Welland canals nothing is said, however great a subject they might be of speculation. But it is impossible to avoid urging the necessity of a combination among the southern states to counteract these measures, and to lead the products of the Mississippi, its dependencies, and those of the Carolinas, to the shores of the James, and the harbors of the Chesapeake, whence it would find its way to a European market at perhaps a cost little less than 15 per cent. under its actual charge.

The influence of the south and lower west would then be united in one body—their external commerce would be concentrated at Norfolk—and the creation of Beaufort, S. C.—of Beaufort, so long sacrificed by demagogues, brawlers and factionists, converted into a respectable military and naval depot, would give a strength and power to these states that would really make them a formidable member of the confederacy—a member of which, in truth, it might be said

"Their swords are a thousand, their bosoms are one."

SMEATON.

P. S.—To show the progress of New York and the supineness of Philadelphia, the following extract from the National Gazette of the 23d July, 1833, is made. "To the Philadelphians we would say, that, if a communication, by a canal or rail-road, is not shortly formed from Pittsburg to the Ohio canal, they might as well at once execute to the New Yorkers a release of all claim to the trade of that immense country which lies north of a line to be drawn from Bolivar, on the Ohio canal, through Indianapolis to St. Louis, and to a considerable portion (of country) even south of that line.

"As matters now stand, New York has indisputable and exclusive possession of the trade along the south side of Lake Erie, of the northern ends of Indiana, Illinois, of Michigan, and of the country westward and northward of Lake Michigan. Every improvement made unto either Lake Erie or Michigan—every increase of the population along or near to these lakes, gives New York an increased business, simply because she has a direct and easy communication with Lake Erie at Buffalo."

Of course this commerce is divided with Canada.

However, let us finish the extract, originally from the Pittsburg Gazette. "Complete the improvements now making over the Alleghany mountain, and make a rail-road from the mouth of Big Beaver to Akron on the Ohio canal, and then we believe that New York will at once be deprived of the trade of this great country."

Statements of American and Foreign tonnage entered into and departed from the districts of North Carolina, Virginia, South Carolina, Georgia, &c.

	AMERICAN.		FOREIGN.	
	Ent'd.	Dep'd.	Ent'd	Dep'd
Virginia, - -	27467	63131	19207	22412
N. Carolina, -	19126	26252	4536	3412
S. Carolina, -	19995	47893	32974	41836
Georgia, Florida, Key West	17928	49124	19471	21565

For the Farmers' Register.

THE GYPSEOUS EARTH OF JAMES RIVER.

As far back as I can remember, crystals were sometimes found on the river shore at Evergreen, (two miles below City Point,) which attracted no farther notice than being admired for their perfect transparency. At that time it is probable that no one in the county had ever noticed crystallized gypsum, or even the lump gypsum of commerce, and no one had given the slightest attention to mineralogy. It is therefore not strange that the na-

* After this had been corrected in order to be transmitted to the Register, the following expressions from a western paper struck the writer's eye. "*The uncertainty attending the New Orleans market, the risk of life and property arising from an unfavorable climate, as well as the difficulty and cost of reaching it from the interior of Indiana (and the neighboring countries,) has doubtless had an influence in bringing about the commencement of this canal*"—*the Wabash and Erie.*

ture of these crystals was not suspected before 1817, when some person better acquainted with the subject, supposed them to be pure gypsum. The expression of this opinion attracted some notice at that time, but was received with general incredulity, founded upon the supposed impossibility of gypsum existing in this region, where it had never been heard of before. A lump was submitted to the inspection of a French apothecary, in Petersburg, who had "chemist" painted on his sign: he at once pronounced that the substance was not gypsum, but *isinglass*.

The interest which I had felt with regard to this substance was soon after much increased by finding some small specimens on my own land, (Coggin's Point.) Having no prospect of having the question decided by any person possessing a scientific acquaintance with the subject, I consulted books, and found such instruction as enabled me to analyze the substance, and ascertain that it was pure sulphate of lime, or gypsum. But, however, satisfactory to myself, it must be confessed that my chemical proof was not much valued by others; because it was thought impossible that a process believed to be so mysterious, could be accurately performed by one who confessedly was ignorant of chemistry, and who had only resorted to its aid for this particular object. To settle all these doubts, I sent collections of choice specimens to two of the most distinguished chemists in the United States, with the request that they would give their testimony as to the nature of the substance. To have complied fully with my wish, would not have required fifteen minutes of the valuable time of either of those gentlemen: yet neither paid the slightest attention to the subject, nor even returned my specimens. These were certainly the *strongest* among the very many proofs I have known of how little aid chemists are disposed to offer to agriculture. As these applications had been made to remove the doubts of others, and not mine, and to attract the public attention to what I considered an interesting and perhaps important subject, the results did not discourage the progress of my own investigations.

I had previously ascertained that the gypseous formation was of much greater extent and importance, than the crystals alone would indicate. In all the different places where the crystals had been found, they were imbedded in the same kind of earth, having a very peculiar appearance, and which extended along the south river bank, with but few interruptions, from Bayley's creek to Coggin's Point, a distance of eight or ten miles. Having so marked a guide for examination as this earth presented, I found gypsum in it in various places, but in such small quantities, that alone it would never have attracted observation. It was evident that gypsum either was, or had been at some former time, diffused through the whole body of this earth, and therefore I distinguished it by the general name of *gypseous earth*, although in most cases there may be no gypsum now remaining. This term of course is not always indicative of the present constitution of the mass. The gypseous earth is of a dull greenish color, mottled with streaks of bright yellow clay. Where gypsum is visible, it is generally in numerous small crystals; sometimes in coarse white powder. At one spot only (where first discovered) are the crystals large. Here they are sometimes several pounds in weight, and of various and beautiful forms. Some are as transparent as glass: but generally, they are of a dark gray color, owing to a small quantity of dark earthy particles being enclosed between the *laminæ* of the crystals. Except at this place, the solid crystals seldom exceed ten or twelve grains in weight, and generally are less than one grain. The most usual appearance in which they are presented on the bank, is that of a star, formed by numerous rays (each a solid crystal) shooting out from a common centre. As these rays are very slightly attached to each other, they generally fall asunder when removed.

In much the greater part of the gypseous earth which has been yet examined, no gypsum is visible; nor is it believed that even the smallest particle remains. But whether gypsum is present or not, the earth is filled with numerous hollow forms or impressions of shells, so as to prove that this was once part of a bank of fossil shells, (or marl as it is here called,) of which the upper part, unchanged, still forms the cover of the gypseous earth, through its whole extent. The yellow clay, before spoken of, is very often presented in the form of shells, as if, when fluid, it had filled their vacant places. Masses of hard marl, coated over with crystallized gypsum, are also found here and there in the gypseous earth. A close examination of the bed, and comparing the impressions of shells with the appearance of those still existing in the upper stratum, or in the neighborhood, will leave no doubt on the mind of the observer, of the change having taken place from a bed of fossil shell to gypseous earth.

This conclusion is attended with two difficulties: In the first place, we are at a loss to know by what agency or means could so extensive, regular, and complete a chemical change have been made, as converting all the shelly matter (carbonate of lime) to gypsum, (sulphate of lime.) Secondly, admitting the means to exist, and the change to have taken place, it is still more difficult to guess what has become of the gypsum so formed—as not one tenth of its proper quantity remains. When sulphuric acid takes the place of carbonic acid, in combination with lime, the greater weight of the former, (together with the water chemically combined) serves to increase the weight of the new compound about fifty per cent: or, in other words, one hundred grains of sheels, or pure calcareous earth, if allowed to combine with sulphuric acid, will form at least one hundred and fifty grains of gypsum. So the mere change of acids being made, ought to give us an earth much richer in gypsum than it before was in calcareous matter. Instead of this, the gypsum is no where so plenty as we may suppose the shells formerly were; and by far the greater part of this bed now is entirely destitute of both gypsum and calcareous earth. What has become of it is beyond my power to explain.

The access of waters containing sulphuric acid, or sulphate of iron, would suffice to produce the change of carbonate to sulphate of lime—and the exposure to sufficient water, and for sufficient time, might dissolve and carry off the greater part of the gypsum. Sulphate of iron is perceptible on the surface of some of this earth near the head of tidewater on Powell's creek, and was abundant enough to greatly injure the land on which some of that earth was applied thickly, for manure. *Sul-*

phuret of iron has also been found intermixed with the gypseous earth: and this mineral in contact with carbonate of lime, would also, by chemical decomposition and new combination, form gypsum. It was at Berkley, in Charles City, that sulphuret of iron was found by Mr. Benjamin Harrison, near the bottom of a pit of thirty six feet depth, which he caused to be sunk in the beach and through gypseous earth. Many isolated masses of marl were reached, (such as I described above,) and Mr. H. thinks that the gypseous earth also was still calcareous. In either case, the chemical change from the carbonate to the sulphate of lime must be still going on, as the agent, sulphuret of iron, still remained in considerable quantity.

The discovery of the existence of gypsum caused the hope to be entertained at first that it would be found in large bodies, and pure enough to form a valuable commodity for sale, and distant transportation. But the examination which led to the foregoing conclusion, also served to dissipate these expectations. As the shelly bed which was the origin of the gypseous earth, was composed principally of worthless sand and clay, the new gypseous formation must have the same degree of adulteration, which would forbid its sale for transportation.

The only remaining use for the application of the new discovery, was as manure in the neighborhood where it was found: and circumstances then existing, and opinions almost universally entertained, prevented much profit being expected from this source, and discouraged even the experiments necessary to test fully the value of the earth as manure. These circumstances and opinions will be stated.

When the wonderful effects of gypsum as manure in Pennsylvania, and in parts of the mountainous region of Virginia, were first made known, the report excited as much of incredulity, as astonishment, or of hope to reap the same rewards. But as a few pounds of pulverized gypsum were sufficient for the purpose, almost every farmer in lower Virginia, who was either enterprising or inquisitive, made some small applications for experiment. This was thirty-five or forty years ago, and perhaps there was not one of these experiments recorded, or the precise result kept in remembrance. But as to the *general* result, there could be no mistake. The failure was so general, that every one of the experimenters agreed that gypsum was worthless in lower Virginia, and in that opinion all others concurred. Some marked instances of success presented on Berkley in Charles City, Curle's, Brandon, and some other fine soils on James River, when the use of gypsum was resumed fifteen or twenty years after, did not shake the opinion of the general unfitness of our land for that manure. In this opinion I fully concurred—and of course could not expect to find our own impure gypseous earth more efficacious, than the purer substance from France or Nova Scotia.

But without expecting profit from the manure, the desire to prove its identity with gypsum caused me to make many small experiments with the pounded crystals, and with the earth in which they were found, in 1817, and afterwards. The results were not such as to promise profit from the extended use, but served to remove all remaining doubt as to the nature of the substance. On the several kinds of clover it sometimes produced remarkable benefit—but more generally, very little. On corn, it was totally inert, except in a very few cases, and in one of these exceptions, the benefit was remarkable. On other grain crops, no effect was ever found. These very different effects, instead of being imputed to the nature of the soil, and the crop, (as I have since ascertained to be the true causes,) were supposed to be evidences of the capricious manner in which this manure acted, and of its general worthlessness for this region. I saw indeed that its best effects was on calcareous soil—and even then began to entertain the opinion which since has been established by facts, that the want of calcareous ingredients in our soils, caused their unfitness to be improved by gypsum. I felt the less inducement however, to continue my applications, because my own gypseous earth was poor, and limited in quantity: and I wished to reserve what there was of it for future use, when my land should be made calcareous, and more fit for clover. For these reasons, my use of the gypseous earth was almost abandoned for six or seven years, and no other person had then made any experiments to test its value as manure.

In the winter of 1825-6, I found, on my land, a small body of gypseous earth containing at least one-tenth of pure gypsum on the average—and portions of it had as much as one-fourth. This caused me to resume its use. In 1826, 565 heaped bushels were applied, about 20 to the acre, (supposed to give from 2 to 3 of pure gypsum,) to various soils, and to different crops. In 1827, between 7 and 800 bushels were applied. The effect on clover, on land calcareous by nature, or made so by art, was as great generally as gypsum has ever produced elsewhere. On cotton, and on corn, the effects were irregular, and taken altogether, were not equal to the cost of the application. But though the use of this earth was now confined to land made calcareous, (as it was evidently worthless elsewhere,) I again lost the greater part of its value by another improper mode of application, which it may be useful to others to state more fully.

Judge Peters, to whom we are indebted for making known and establishing the value of gypsum, was of opinion that one of its operations is to hasten the rotting of vegetable matter with which it is in contact: and thence he deduced the opinion of the propriety of mixing gypsum in heaps of compost, or of other coarse putrescent manure. Besides gaining this particular benefit from mixing the gypseous earth with my stable and farm-yard manures, (which I was ready to believe on the high authority of Judge Peters,) I expected to derive from that practice a still greater benefit in distributing easily and equally the earth over the land, which was very troublesome to spread alone. For these reasons, the greater part of my gypseous earth was spread over the litter in the farm-yard and stable, in such quantities as was supposed would give about 20 bushels of the earth to every acre covered by the manure. The heaping of the manure to ferment, then cutting it down to load, and spreading it over the field, no doubt divided and distributed the gypseous earth very equally. It showed no effect on the succeeding crop, corn, (at least none that could be distinguished from that of the putrescent manure,) and none on the wheat, which followed. I had not expected much better results on these crops, but relied confidently that my

clover, sown on the wheat, whould show the effect of the gypseous earth equal to any on other land, where it had been applied alone. In this I was totally disappointed. Not the least effect of gypsum could be discovered on the clover—and thus the whole of this application was thrown away, as well as the greater part of the succeeding winter's application, which in like manner had been mixed with my other manure, and which had not then arrived at the time to prove its uselessnesss. The cause of this inefficiency is now plain enough. Fermenting manure, (and probably all fermenting vegetable matter,) forms *oxalic acid*, which attracts lime so powerfully as to take it from all other combinations in which it can be presented. This acid thus meeting with the sulphate of lime in the gypseous earth, at once decomposed it, and destroyed the peculiar manure before existing. No particle of gypsum remained to be carried out, and act on the land. It is useless here to extend my remarks on this operation of oxalic acid, as it has been done at length elsewhere :* it is sufficient to show by this statement that my obstinate adherence to this mode of application, for two winters, caused the loss of the greater part of gypseous earth, as well as the labor of applying it. The rich seam was by that time exhausted, and my latter use has been with the poorer body, which, it is possible, may not be cheaper than to buy the imported gypsum. However, within the last year, my friend and neighbor, Thomas Cocke of Tarbay, by applying earth apparently still poorer in gypsum, has produced such remarkable benefit on clover, that I am encouraged to return again to this kind of manure. The earth he uses is brown, and differs much from the general appearance as described above. We are both satisfied that the gypseous earth possesses some power to aid the growth of clover, independent of the pure gypsum contained. Last year, (1832) to test this opinion, I sowed French gypsum on clover at the different rates of 1, 2, 3 and 4 bushels to the acre on marked spaces. The benefit of the smallest application doubled the crop of clover—and it was increased by the heavier dressing, though not at all proportioned to the quantities applied. But the clover on the heaviest application (of 4 bushels,) was not to compare to the effect seen on neighboring and similar land, from 20 bushels of my best gypseous earth, and which was not greater rhan had often been found elsewhere. Mr. Cocke finds equal benefit, on clover made on poor light land, (that is, it is made as heavy as it can well stand,) from 40 bushels of his earth which appears so poor. It is necessary to observe that all these instances of benefit are on land made calcareous by fossil shells : and on my own, last spoken of, before that operation, the gypseous earth had been used, in heavy as well as light applications, and without the least effect. The very rich bed of gypseous earth at Evergreen has only just now been opened for use.

The statements made of my own practice show that I cannot boast of having derived much (if any) profit from the use of gypseous earth. Nevertheless, my experience may be more useful to others than it has been to myself, and the misapplications caused by my inexperience and ignorance may serve to show others, who have access to such manure, how to make proper use of it.

* Essay on Calcareous Manures, pp. 143 and 224.

Within the last year, circumstances have attracted attention, and been made public, which induce the belief that this formation of gypseous earth is much more extensive than was before supposed. The marl beds in Hanover and Henrico, not far below the granite ridge, are covered by an upper bed of clay, which is very different in appearance from our gypseous earth, but agrees with it in being full of impressions of shells, and being destitute of any portion of the carbonate of lime, with which it was evidently so well furnished at some former time. No gypsum is visible. This earth also differs from that of Prince George in containing pure sulphur generally diffused throughout, as made evident by its strong sulphureous scent. I do not know that this singular and extensive formation is valuable as manure—but it is at least worth examination and trial. The clay bank through which Governor's street in Richmond is cut, is full of such impressions of shells, though it does not contain, and is not known even to cover, any remaining calcareous matter. If shells are below, as is probable, this is very near their termination in this direction.

In the bed of Howard's Creek at the point where it flows nearest to the White Sulphur Spring, (within a few hundred yards' distance,) there are many pebbles, varying greatly in form, appearance, and chemical composition, but agreeing in containing (like the earth before described) numerous hollow forms of small shells, of which nothing of the substance now remains, nor any trace of carbonate of lime. These stones are as solid and hard as those of similar external appearance usually are, which makes still more strange and unaccountable the entire disappearance of the shells which have at a former time been enclosed. I have mentioned this fact because it may possibly attract the attention of some of the men of science who visit that place, and induce them to observe and explain these singular facts. The silicious fixed rocks lying close by the Sulphur Spring also have many star-like impressions on their surfaces, (but not within, as in the other cases,) which from their similarity and regularity of form, must have been caused by small shells of one particular species. I found a similar impression on a pebble in the bed of the Calf Pasture River—and perhaps such facts may be numerous, and well known to others. In all these cases, there was not the least particle of carbonate of lime remaining in these stones, (as proved by chemical tests,) nor any appearance (to the eye) of any other salt of lime, to which the carbonate might have been changed.

The highland which lies over the wole extent of the gypseous formation in Prince George presents a surface and qualities of very peculiar appearance, and which may possibly have some connexion with the gypseous bed below. If so, my description may direct more successfully the search for gypseous earth elsewhere. The land from Bayley's creek to Coggins' Point, except where interrupted by some low alluvial tracts, seems as if it had been originally a high and level bluff, or abrupt termination of table land, which had sunk in successive slices, the lowest next the river, so as now to present somewhat the appearance of a hill side cut into terraces. Of course, this form is extremely irregular. The broken strata cause the greatest variety of surface : fossil shells fit for use as

manure, barren clay, barren calcareous sand and rich black soil, were all to be found in almost every acre, and remained distinct, until mixed by the cultivation of the surface. It does not rest on mere conjecture that this land took its present form and depression by sinking or *slipping*, as a similar natural operation to considerable extent, has taken place on the Tarbay farm within a few years, the progress and consequences of which are still visible.

The rich gypseous bank, at Evergreen, is at a place where the river is encroaching on the land, and every storm or every high tide, adds to the acres which have doubtless been already swept away. In this manner was formerly exposed the remains of the trunk of a tree, lying even with the beach, and which when wet, presented the same spongy and soft texture on the surface, smooth and even yielding to the touch, as is usually seen in rotten and water-soaked logs. But except the surface, where water had probably dissolved the substance, every pore and cell of the log was filled with gypsum, though the form and grain of wood remained distinct. This complete filling of the cells could only have taken place when the gypsum was in a fluid state. The circumstance of a tree being found beneath a bank of shells, or what had been shells, might seem to be a proof that the shells were the latter deposit of the two. But it is easier to believe that the whole body of earth, (though perhaps 50 feet high—was formerly thrown into its present place, by one of those land-slips which have been already spoken of.

There is a kind of earth in New Jersey which was called *marl*, (as almost every earthy manure has been) but which seemed to me, from the imperfect descriptions given of it, to be the same kind of gypseous earth that I have described. Although this Jersey manure excited attention, and was bought, and tried, and reported on, by Judge Peters, there was no certain indication given to the public of the component parts of the earth, or what constituted its fertilizing power. Judge Peters speaks thus of it. "It is said by some that the *Jersey pyritous earth, called marl*, is of this description, [i. e. a mere stimulant;] and by others that it is permanently fertilizing. Nothing decisive can yet be pronounced, as its many varieties differ in their respective effects. There are effects both ways; so that this earth when applied, and the soil it is intended to assist, should be carefully scrutinized, and the qualities practically known. Some English chemists to whom it has been sent, style it an *hydrat of iron;* while others designate its composition, as a collection of decomposed *granite, schorl, silex, alumine, iron;* in some specimens (no doubt those mixed with shells,) *lime* and *magnesia* with *sulphur*. A more accurate knowledge of its parts and properties is still required; and it is to be wished that our own chemists will give us their assistance. *Broom grass* and other pests on worn lands may be destroyed by a top-dressing of this earth and chloritic sands of a similar, though, not so potent a nature; which substitute a natural growth of white clover."* In a communication of later date, Judge Peters made the following incidental remarks. "Four years ago, I procured 40 tons of Jersey manure, and spread it as a top-dressing on many parts of the Belmont farm, on sand, clay, loam, and in every variety of exposure, as well as on moist and dry grounds. But in no instance any profitable effect appeared. A broad strip of the lawn, light and sandy, had been top-dressed, and showed no signs of melioration heretofore. This strip is part of my little oat field; and it has [this year] thrown up a most luxuriant growth, far exceeding any other part, (though the whole was good, having been well *limed* throughout,) and affords a proof that this manure agrees with and co-operates with lime. I never saw, in the richest soil, stronger, better headed, or more promising plants. It would have been incompatible with my objects, or I should have suffered it to ripen, for experiment of its product. Mr. Mark Reeve, who is very intelligent on this subject, (and to whom I sent a sample of the manure,) informed me that I had been imposed on by the person from whom I procured it; the article used by me being only the cover of the true kind. Its effect, luxuriant as it is, must have been more so, if the perfect manure had been used."* I have seen it stated elsewhere, (though I am not able now to refer to the authority) that the Jersey earth was particularly beneficial to clover, and that it was used in small quantities, compared with other manures.

The description of the Jersey earth, and the effects imputed to its use, agree very closely with those of our gypseous earth. But it also seems, that no one entertained a suspicion that its value was owing to its containing, or forming gypsum. I therefore infer that the earth there used was similar to the great body and poorest kind of ours, having not a particle of gypsum remaining. If so, the effects produced as manure, were probably owing to either *sulphate of iron*, or *sulphuret of iron* remaining in excess in the earth—which, when meeting with *lime* in the soil, formed gypsum—and if no lime was present, remained either (as the *sulphuret*,) and inert, or (as the *sulphate of iron*,) a poisonous ingredient of the soil. *Iron pyrites* (sulphuret of iron) have been used with much benefit as manure—though that effect would probably depend on whether the soil was calcareous or otherwise.

From the publication of the passages quoted above, and many others on the same manure that appeared about 1819, and soon after, it might be supposed that the attention and labors of chemists would have been drawn to this manure, and its composition and value clearly settled; and that practical farmers would have fully profited by this instruction. On the contrary, all notice of the manure soon ceased, and no information thereon has since been given to the public. It may therefore be inferred that the manure was used so ignorantly, as not to be found profitable in general, and that even the solicitations of Judge Peters, and the influence of his venerable name, could not obtain this small aid from men of science, which might have shown when and why the manure was useful, or otherwise. If my views of its constitution are not mistaken, it is certain that this manure will be found useless on most poor soils, unless calcareous earth is used previously, or in conjunction.

EDMUND RUFFIN.

Shellbanks, Aug. 9, 1833.

* Notices for a Young Farmer—by Judge Peters.—Phil. Memoirs, vol. iv.

* Phil. Memoirs, vol. iv.

CULTURE OF CORN.

To the Editor of the Farmers' Register.

Fairfax county, August 21, 1833.

In your No. 3, under date of the 24th June, I find you have inserted an extract from my letter to you (on the unjust and oppressive law, concerning fences.)* I thank you for doing so; the subject is now before all Virginia, and I hope that every man interested in the sacred rights of property, (and who is he that is not?) will give the subject a fair, cool, and impartial consideration. I am a self-taught man, and too old to make an effort to show that two and three make five—and I should consider it equally frivolous and ridiculous, to attempt to show, that in a community guided by morals and law, a man is entitled exclusively to the use of his own.

Some of your correspondents are inquiring for the *best* mode of making corn. I do not pretend to any knowledge of the *best* way of doing any thing; but I will say what I do, and leave it to those concerned to determine what is *best*. My corn is now nearly stripped, and as soon as the ears are sufficiently dry, we gather, and then cut off the stalks and haul them out in a succulent state to the cattle, upon the land intended for corn the next season; with this, follows all my straw, strewed or put in racks as may seem best—taking particular care of the weakest parts of the field. From time to time, in the winter and spring, the whole is buried with a good two horse plough—(I have used four horse and three horse ploughs.) The whole is then harrowed close down; furrows are then drawn at right angles, five feet one way and three the other; four or five grains are then placed at each intersection, and covered lightly with a hoe. As soon as this is done, the space in each direction between the furrows or rows, is worked with a single coulter, moved by one horse, eight or ten inches deep, until there be some appearance of grass upon the ground, or until the corn shows its preparation to go into the tassel, when a cultivator is put upon it, until the silk begins to show. It is then left, and we have no fear about results. When the crop comes off, we see very little of the corn stalks, or straw, unless the season has been very dry. A two-horse plough is then used to throw it into shape to receive wheat. When we thin, we dress the plants with a hoe. In addition to this, I keep a farm-yard, where my milch cows, &c., are kept, and we apply the proceeds to surface dress wheat, or use it upon the poorer parts of the corn-field. To this use I also apply my stable and sheep-pen manure. The experience of more than thirty years gives me authority to say, that surface dressing is the best application of those kinds of manure, for this, if for no other reason—that a given quantity will dress a double surface.

By this practice, and a very free use of the spade (my farm is very low and level,) I now make from eight to ten times as much as was made upon it twenty-five years ago, when I came to the possession and management of it. It is due however to a bare statement of facts, that I should say that I wandered many years in the dark, and waded many in the water, before I even saw my way clearly. My corn is not bad this year, though the most of my neighbors will not make the fourth part of a fair crop. Wishing your valuable work that reception with the public which it merits, I am your friend, JEREMIAH.

[We shall be obliged to our correspondent if he will add to the value of the foregoing communication by describing particularly the shape and size of the coulter which he uses, and its operation in pulverizing the soil, keeping down the growth of weeds of different kinds, &c.]—*Ed. Farm. Reg.*

* See Farmers' Register, No. 3, page 185.

COMMERCIAL REPORT, AND PRESENT PROSPECT OF MARKETS.

[We are indebted for the following article to a gentleman who possesses much commercial and general information; and hope that a similar report of markets, and prospects of markets, will be furnished monthly. We are sure that such reports will be interesting and sometimes may be profitable to many of our readers.]—*Ed. Farm. Reg.*

To the Editor of the Farmers' Register.

It is gratifying to observe the favorable condition of the agricultural interests in the United States generally, and in the southern states especially—maugre all party and political complaints.

The prices of all the most important articles of produce are good; and I believe it requires but industry, good management, and a judicious use of those resources which nature has bountifully provided, to render our state, good old Virginia, prosperous, to check that migratory disposition which has too long prevailed, and to restore her to the eminence that she attained in the by-gone days of the Old Thirteen.

It is no wonder that Virginia has not advanced at as rapid a pace as her younger sisters (or more properly, daughters) have. She has contributed more than any other state, to people those western regions, a large portion of which once constituted a part of her territory—and she has suffered not only the abstraction of population, but also of capital. Large fortunes, acquired by commerce, when its profits were inordinate, have been constantly withdrawn from her, to add to the wealth and resources of other countries or states, and the vacuum created by the removal of a capitalist has been filled by a new comer without capital—who, if successful in acquiring one, followed the example of his predecessor. Thus has Virginia been but a nursery of population and wealth; to be distributed abroad, as fast as it was produced. The natural effect has been, to retard the growth of our towns, the extension and improvement of agriculture, the developement of natural resources, and the formation of roads and canals, which give an impulse to the others.

From this situation I believe we are now becoming disenthralled; and if so, brighter prospects will open to us. Let our energies be exerted, and they will make us prosper. Our mines, our quarries, as well as our fields, contain abundant sources of wealth.

From these general remarks, I will descend to others of a limited character. All the agricultural products of Virginia, and of the southern and western states now command high prices. Wheat sells at 112 to 125 cents—Cotton at 15 to 16—To-

bacco 4½ for such as formerly was not worth sending to market—7 to 10 for good quality, and at much higher prices for such as pleases the fancy of manufacturers.

The extent to which the manufacturing of tobacco in Virginia has reached, is almost incredible. It is not thought extravagant to estimate it at 18,000 hogsheads annually, or about one half of the quantity inspected. The manufactured article finds its way, legally or illicitly, to every part of the world. Large quantities of Kentucky tobacco are now imported into Virginia, where it is stemmed, and then shipped to Great Britain. The amount of capital and labor thus employed is very great: but it is considered (and perhaps with good reason) by many, as expended on not only a useless but a deleterious article. It may well be questioned, whether the agriculture of Virginia has not been more injured by the cultivation of tobacco, than the profit derived from it can recompense.

The preference given in the ports of South America to Virginia flour, and particularly to that ground at Richmond, renders our wheat markets as good as any in the union. It will require all the skill of millers, in manufacturing the present inferior crop of wheat, to sustain the character which they have acquired. The quantity of flour shipped from James River to South America in the months of August and September, may be usually estimated at 25 to 30,000 barrels; and during the year, at more than double that quantity. The mills which recently have been, and those which are about to be put in operation at Richmond, may invite, if not defy comparison with any in the world; and those of Petersburg, though not so extensive, have acquired a high reputation for the quality of their flour.

The improvements in machinery for the manufacture of cotton goods, and the cheapness of the raw material, have caused such an increased use of cotton fabrics, that the demand has at this time overtaken the supply—the consequent advance in price, while it gives a stimulus to increased production, will at the same time diminish the consumption; and at no very distant date, the operation of these two causes will reduce the price of the raw material to the level of the last four or five years.

The crop of the United States (1831 and 1832) amounts to about 1,030,000 bales, of which

Great Britain consumes	about	600,000
France,	"	" 200,000
Other parts of Europe,	"	70,000
The United States,	"	160,000

The growth of cotton in the United States in 1824, was but 560,000, and that of the present year, it is surmised, will be 1,150,000.

It is but four or five years since the first successful experiment in Virginia, in the manufacturing of cotton, was made in Petersburg. The example has been followed in Richmond, Manchester, Fluvanna, and Smithfield. The quantity spun in these places may now be estimated at 6000 bales annually; and it is said that other mills are about to be erected at Petersburg and Richmond. The employment given in these establishments, to a class of respectable persons who had been peculiarly destitute, will, it is hoped, be attended with beneficial results, instead of the reverse, as has been apprehended by some.

The commercial interests of Virginia appear to be thriving. A regular line of packets between James River and Liverpool is about to be established by an enterprising house in Petersburg. The rail-road from that place to Blakely on Roanoke (60 miles) is now in active use; and a journey which formerly required two days, is now performed between breakfast and dinner, and may be retraced by tea time. If our public functionaries will make suitable arrangements, the great mail from north to south will be expedited one entire day by this road.

If I have not fatigued you and your readers, I make my acknowledgments for their patience; but as you have brought the burthen on yourself, I leave you to bear it, taking with you my best wishes for your success. X.

MEANS FOR PRESERVING POTATOES.

Translated for the Farmers' Register, from the "*Journal d' Agriculture, etc. des Pays Bas.*"

To preserve potatoes from the frost, and retard their germination, is an object of great importance in rural and domestic economy: therefore nothing ought to be neglected to attain this end. We consequently think it our duty to inform farmers of the result of experiments repeated for many successive years. It has been found that when potatoes are covered 3½ feet in earth, they are not only sheltered from the coldest weather, but may be kept for almost any length of time without germinating, or giving the least sign of vegetation: but if they are buried less than 3½ feet deep, they will germinate. Potatoes have been preserved in this way for three years, without undergoing the least change.

Then, to preserve these precious vegetables, it is only necessary to dig a trench deep enough to cover them up 3½ feet deep. We might in this manner preserve a considerable quantity in years of plenty, which would be good food for man, or animals, in years of scarcity. But one might, perhaps, and with good reason, object to this experiment, from the difficulty of digging up the potatoes, from such a depth, as fast as they are used. To obviate this inconvenience, we may dig, on sloping ground, a trench of convenient depth, around which a wall must be built to support the earth. At the lower end of the trench, and on the surface of the earth, a door must be made, as in a lime kiln. After filling up this subterraneous magazine, with potatoes within 3½ feet of the top, they must be covered with sand, which will be 3½ feet deep, to fill up the space.

The potatoes must be taken out, as they are wanted, by the door of which we have spoken of before, made at the lower end of the trench. The potatoes must be always covered with sand, to shelter them from the atmospheric air which causes germination.

The advantages of preserving potatoes without any change would soon indemnify the expense of building, which is very trifling, since very rough brick work will answer for the walls of the excavation, which must be made on sloping ground.

After having used all the potatoes, if you wish to fill the trench again, the sand must be taken out, which will do to cover the new potatoes.

For the Farmers' Register.

EFFECTS OF CALCAREOUS SOIL ON HEALTH. DISEASED TREES.—POTATOES

The 2d No. of the Farmers' Register contains the 'Supplementary Chapter' to the Essay on Calcareous Manures. I was highly delighted with the views which were taken of the probable effect of marl in purifying the atmosphere, and rendering those situations, which would be otherwise unhealthy, fit habitations for man. To the short ken of human reason it has always appeared mysterious that some of the most fertile portions of our globe with every other natural advantage save that of salubrity, should still deny to man a residence, and only seem suited for the abode of beasts of prey. But how pleasing the reflection, (if the views taken be correct,) that the "noisome pestilence" shall be restrained, and the desert made subservient to the use and enjoyment of man.

In the 3d No. of the Register, a writer, under the signature of "M," has told us, that since the town of Mobile was paved with shells, it has become much more healthy. This is strong probable testimony in favor of the principles advanced. A few days ago, and before I saw the third No. of the Register, I saw a near connexion, who has just returned from a settlement which he has made on the Black Warrior, about 50 miles below Tuscaloosa. He spoke of the fact that Mobile had become much more healthy within a few years, without, however, assigning any cause. He also represented a very large portion of that country, between Tuscaloosa and Mobile, as calcareous, and abounding in shell marl. He says, the country, if not more healthy, is certainly not more sickly than this part of Virginia, and that it appears to be generally understood, there, that the marl preserves it from disease. As one evidence of the fact, that the country owed its healthiness to the marl, he stated that in the more northern parts of the state, where that deposite was not found, the country was more sickly.

As every thing on the subject may be interesting, and draw out facts still more illustrative, I have thus, in a brief way, made the above statements.

I shall be very glad, another season, to put in practice the plan proposed in the third No. of the Register, for destroying the insects which are so injurious to our stone-fruit. I am a great lover of fruit, and have been at considerable trouble, and some expense, to procure many of the plumb, peach, &c.; but, owing to the curculios and other insects, I can scarcely enjoy a *perfectly* sound and matured fruit. It has long been a great desideratum to find out something which would preserve from the ravages of insects the delicious fruits of summer; and should the plan proposed prove effectual, the inventor will deserve the thanks of all the lovers of such delicacies. But I wish the writer had told us whether the application of the remedy will be necessary every year. The plan proposed reminds me of a practice which I adopted, a few years ago, with an ill thriven locust which stands in my yard. It had been planted out three or four years, and in that time had not grown the 16th of an inch. It seemed to be the utmost effort of its vegetative process to unfold the leaves, and yet, as far as could be perceived, it was not subject to any particular disease. I, however, determined to try the effect of a dose of calomel, (which, you know, the doctors are too apt to think the 'sine qua non,') which I administered in a dose of about 150 grains, by boring holes with a gimlet a few inches from the ground, and filling them with the medicine. The next season it began to thrive, and has grown most rapidly ever since. Let others try the experiment, and see whether trees do not as often require medicine, and are as often benefited by it, as men.

I am just gathering my Irish potatoes, before the falls rains set in to make them watery; and the experience of ten years confirms me in the belief that my mode of cultivation possesses advantages over every other. And these are: first, that it requires very little labor, and secondly, that the product is infinitely greater than I have ever known from any other plan; and thirdly, that the increase is not in proportion to the fertility of the soil, that is, a moderately fertile soil will produce about as well as a rich one, and in the process of cultivation the soil is necessarily made rich. In February I spade up the land well, and lay off rows, by stretching a line and marking with a stick or handle of a hoe, 18 inches apart. In these rows I plant the potatoes 10 or 12 inches from each other, just deep enough to cover them well, that they may vegetate and take root, say from one to two inches. Any time before the sprouts come out of the ground, I have them covered with straw, or pine leaves to the depth of eight, or even twelve inches. I find it well to throw a few corn stalks or bushes thinly over to keep the covering from blowing off. My experience has proved that the crop is incomparably superior when the plantings are whole, and of pretty good size. Indeed it is better, every two or three years, to start with a fresh stock. Gathering will be found very convenient, as it is only necessary to remove the covering with the hand, and the potatoes will be exposed to view in groups, like eggs in a nest, on or near the surface, when the largest can be plucked. I have never made a measurement of the quantity produced, and would not, therefore, hazard a guess, lest it might be thought by some extravagant; but I am sure that no one who shall try the plan two or three years, will ever abandon it for another. W. I. D.

Nottoway, Aug. 22d, 1833.

YELLOW LOCUST.

To the Editor of the Farmers' Register.

Being desirous to aid, if I can, in improving the state of agriculture, I have ventured some suggestions for the consideration of those of more knowledge and experience than myself, on rearing the yellow locust, for several purposes. It strikes, me, that the yellow locust would be more durable than white oak for the sills for rail-roads. I am not able to say how long they would last, but I think more than twice as long as white oak sills. The growth of the yellow locust, on good soil, is very rapid. In fifteen years from the time of planting, in a fertile soil, the trees would be large enough to make sills for the rails for a rail-road, and those sills would last twice as long as those made of white oak. They might be reared on lands along the route of a rail-road, so convenient as to save all the trouble and expense of transportation for any considerable distance. In the last No. of the Register, Mr. Grigsby has shown the advantages of raising

the yellow locust for sale, and for sundry farming purposes. From a quotation of his from the New York Farmer and Gardeners' Magazine, it appears the expense of raising a yellow locust tree twelve years old would be about eight cents and a half. These trees can be raised much sooner than the white oak; and the day is not far distant when our farmers will have to raise trees for timber. It is said wooden sills and rails answer much better for locomotive transportation on rail roads, than those made from granite. It is probable, therefore, that if rail-roads answer the expectations of those who have tested their uses thus far, (of which there can now be little doubt,) a great quantity of timber must be used in keeping them up.

The yellow locust would answer an excellent purpose, for posts and rails too, for fencing. A fence made of this kind of wood, would outlast any that could be made of any kind of wood. A plan was suggested to me in a conversation with a farmer of great experience several years since, which I think he said he had then adopted, which would answer well in constructing a fence of yellow locust. He said he had posts for a straight fence cut and carried to a convenient cover, and when his male laborers could not be employed out of doors in rainy or excessively cold, frozen weather, he had them employed in boring and morticing his posts. By this means he generally had enough on hand to make all repairs to his fences, which were all post and rail fences. The locust posts might be cut and housed in the fall, and prepared in this way, when the hands were prevented from being employed out of doors. We farmers in Virginia are too much in the habit of saying "it will do," and doing things in a hurried and slovenly manner. Labor and pains, care and attention, are necessary to attain valuable results, in any calling or profession. I hope your Register will tend to awaken the zeal and the spirited exertions of our farmers, to improve the face of our country, and add to our comforts and happiness, as members of a free and enlightened community.

WILLIAM SHANDS, JR.

Hickory Hill, Prince George,
August 12, 1833.

MR. SMITH'S COLLECTION OF DAHLIAS.

We invite the attention of all who are fond of flowers to the advertisement on our cover, of the valuable and extensive collection of rare and beautiful dahlias, belonging to Mr. Smith of Baltimore, and which he now offers for sale. No better opportunity can be availed of by those who wish to possess these splendid flowers, which are as yet very rare in Virginia, though so fashionable and highly prized elsewhere. The cause of agriculture is indebted to Mr. Smith for the aid which he has for years been giving to it, as editor of the American Farmer, with much credit to himself and benefit to the public: and those who may now patronize his horticultural skill and labors, will at the same time make some return for sacrifices of time and talent which he has made for the general benefit. We have not the pleasure of being personally acquainted with Mr. Smith, but from all that we know and have heard of him, we feel assured that those who will direct to him orders for his dahlias, may confide perfectly in their being executed, promptly and faithfully.

We cannot boast of possessing either taste or knowledge with regard to flowers, and we are indebted to a friend for the following information, which may be acceptable to those who are but little acquainted with this splendid flower.

DESCRIPTION OF THE DAHLIA.

Loudon's Encyclopedia of Plants says, the Dahlia is "one of the most fashionable *hardy* plants." The Encyclopedia of Gardening says, "the roots of the Dahlia are tuberous and fasciculated; the stem rises from 5 to 8 feet high, [rather from 2 to 12 feet,] covered with large compound leaves, resembling those of the common dwarf elder, and with side branches bearing numerous flowers of a great variety of colors, which appear in August, [here in July,] and continue until destroyed by frost. * * * At present (1827) the Dahlia is the most fashionable flower in this country, [England] and the extent of its culture in some nurseries, especially that of Lee, is truly astonishing. Nor is this to be wondered at, as Sabine observes, for, independently of the great beauty and diversity of the flowers, they are in perfection at a season, when, till they came into notice, our gardens had but little ornament."

Again, Loudon's Encyclopedia of Plants, speaking of the class of syngenesious plants, says, "It abounds in plants of ornament, all of which are, without exception, of easy cultivation. It is not necessary to particularize the merits of the *brilliant varieties of the Dahlia*, or of the Chinese Chrysanthemum, which are the chiefest ornaments of every autumnal garden."

A fine double flower resembles in form the double white Camellia Japonica; sometimes much larger, and sometimes smaller. A large well formed full blown double rose is a tolerable likeness of a common double Dahlia, except as to color, which is of every hue you can conceive of being formed out of any of the primitive colors, white, yellow and red. Many of them partake largely of blue, but none are entirely of that color, always having a portion of red sufficient to constitute some of the shade of purple. Others partake largely of black, resembling at a short distance, black velvet slightly tinged with scarlet. The single flowers also assume various forms. Sometimes they resemble sun-flowers slightly; at others, stars with five or six angles, but of all the various colors above described. They have no fragrance, and continue to bloom abundantly from July till stopped by severe frost. The plants are coarse, and no way prepossessing till in flower: but *then*, all other flowers are passed by. The roots are like sweet potatoes, and attached by the end to the stalk, and require slight protection from the frost in winter, which is easily afforded by placing them in a cellar, or in the holes with Irish potatoes or turnips.

EXPECTED SPECULATIONS.

To the Editor of the Farmers' Register.

I predict that there will be a good deal of speculation in the next six months, and consequently, a good many losses in the six which will follow. Some will speculate in flour, because *there may be* a short crop of wheat in England—some in cotton, because there *was a small crop* last year—some in tobacco, because there is *less shipped* this year than usual.

AN OLD MERCHANT.

EXTRACTS FROM PRIVATE CORRESPONDENCE.

BUFFALO CLOVER.

Prince Edward, July 4th.

* * * I enclose a few Buffalo clover seed, thinking they might possibly be a curiosity. The plant is a very luxuriant one, but is only seen when May and June are wet months, and it dies about the last of June. It much resembles the common red clover—so much, that I cannot distinguish them until late in May. So that, I cannot say at what time the seeds vegetate. I was very much pleased, about six weeks ago, to observe about two acres of poor springy land well covered with young clover—thinking it was red clover. But in a few days I ascertained it to be Buffalo. With the aid of lime it might vegetate every spring, and in that case would certainly be valuable. It affords a heavy cover to land, and fine grazing for a month or two. * * *

Essex, July, 1833.

* * * My impression is, that 64 pages of agricultural matter is too much to throw before a farmer at a time, and that it will be laid by for a more convenient season. A weekly sheet I think would have been more desirable. I wish the type had been larger: the quantity of matter would have been reduced, but the pleasure of reading would have been increased. * * *

If our personal interest and profits were considered alone, we should wish all our patrons to agree in this opinion, as the adoption of both the changes recommended would serve to lessen the expenses of publishing the Farmers' Register at least $500 a year. We think, however, as at first, that the monthly form, on the whole, adds much to the value of the work, though certainly there is some ground for the objection made by our correspondent.—[*Ed. Farm. Reg.*

GAMA GRASS.

Columbia, S. C., July 15th, 1833.

I might probably be able to get for you a few seeds of the Gama grass, (Tripsacum Monostachyon,) which grass promises to become of immense advantage to our country. I have but little of it myself, from a few seeds given to me last year, and its growth this season induces me to gather all the seed I can, and cause some to be gathered where it grows spontaneously, about thirty miles above this, so as to plant next year one or two acres of it. I sow the greatest part of what I have for seed, which I most carefully gather myself, grain by grain, every day as it ripens; for, if this be not done, the most of it will be lost, as it drops as soon as ripe. I have reserved a small portion of it to ascertain how often it can be cut in the season, and the quality of the fodder made of it. It was cut for the third time on the 1st inst. and expect to cut it again three or four more times this season. It is now from fifteen to eighteen inches high. That which was left for seed not having been cut at all, is, some of it, about seven feet high to the top of the ear, the blades being at least four or five feet, and forming a very great mass of vegetation, on a very dry and naturally poor soil, only tolerably manured. The green grass is not very succulent, and therefore does not lose much in drying; and when cured, the fodder or hay is very highly flavored, and eaten very readily, in both states, by both horses and cows. Its roots being very large, and sinking very deep in the ground, enables it to resist the drought better than almost any plant I ever saw. * *

We feel much gratification in being enabled to inform our correspondent, as well as the farmers of this state, that it has just been ascertained that the Gama grass is a native of and grows luxuriantly in Virginia, without culture and without notice. The letter of Mr. Meares, which describes the plant so minutely, (and which will be presented among the selected papers in this number of the Farmers' Register,) reminded Dr. John Bragg that he had formerly observed tufts of a similar grass on the borders of a meadow which he owns, adjoining Petersburg; and, on examination, it was found to be undoubtedly the Gama grass. We saw it on August 23d, and compared it with Mr. Meares' description. Before this interesting fact was known, we had selected for publication the several pieces on this subject which this number will contain, with the view of directing the attention of our farmers to the *introduction* of so valuable a grass: but its culture may now be expected to be far more profitable, when we know that it is indigenous, and already acclimated in Virginia.—[*Ed. Far. Reg.*

POUNDING OYSTER SHELLS, ETC.

Nottoway, July 18th, 1833.

The subject of marl is exciting considerable interest in the upper country. * * * I was pleased to see in your first number the result of an experiment of the application of pulverized oyster shells as a manure. I had myself thought of making such an experiment, but how to reduce them to particles sufficiently small was the difficulty. I have, however, thought of a plan which, although I may never derive much personal benefit from, situated as I am, yet others may. The late thirst for gold hunting, has brought into use amongst the miners various expedients for breaking down the rocks, to collect that metal. I understand, from a gentleman living near one of the mines, that some of the machinery used for that purpose is very simple and cheap, and would easily reduce the shells to a powder. He promised me that he would send me a carpenter's bill and model for the construction of one, which I expected to receive four weeks ago. I shall write to him in a few days, and if you think it would be worth it, I will give you the information. Should the expense justify *me* in doing so, I can bring back shells in my wagon when carrying down my wheat.

BUCKWHEAT. EXPERIMENTS WITH GYPSUM.

King William, July 9th, 1833.

You expressed a wish to me to know something as to the cultivation of buckwheat. For several years I have raised enough for family use, but have not been so particular as to observe minutely its product, or the probable profits attendant upon its extensive cultivation; but perhaps I may be able, by stating what I know, to excite a spirit of inquiry, which may eventuate in its more extensive cultivation in lower Virginia. If so, I should be gainer, as I delight much in a well cooked cake, floating in rich fresh butter, and but seldom meet

with it, except at my own table, where, throughout the cool weather, it is a standing dish, and is most cordially embraced by all who breakfast with me, notwithstanding it is raised by so few. The impression of many is, that our climate does not suit it. This may be, to a certain extent—we may not raise so heavy crops as in some other situations, but it bears a good comparison with most other crops raised by us. For ten years I have raised it, obtaining the seed from my friend and neighbor, Mr. J—— R——, who for many years before, had raised it, and still continues to do so. The product depends much upon the season, a cool damp one suiting best. One year Mr. R—— obtained from three bushels, 96; but this is uncommon. I think I may say that I average, upon common land, 8 or 10 bushels to the acre. I have made 20. I shall now, in a day or so, commit mine to the earth. I have hitherto sown upon wheat stubble: sometimes I have scattered the seed on the stubble, and ploughed in, giving either a slight harrowing or running over the surface with hoes, taking down the inequalities. This year I purpose fallowing up a clover lot, on which I shall sow the seed and neatly harrow them in. Buckwheat should be sown just time enough to mature before frost. Being a tender plant, it should, if possible, be cut before frost; but it ripens gradually, and is in bloom even at the time we are compelled to cut it: hence we may infer, that in a climate rather cooler, without early frost, the product would be immense. It should be cut when damp from dew, suffered to lie on the ground a day, or so, then raked in small parcels in the morning, when damp. When sufficiently dry, in the heat of the day it should be carefully placed in carts, hauled to the barn, and if convenient, (but not necessarily,) thrashed immediately. From half a bushel to three pecks of seed to the acre, is the usual quantity. I doubt not, that when taken from the earth, it is an exhausting crop; but if returned by a fallow, (which I have in one instance done,) I am convinced it aids the land very much. It is particularly adapted for land which has been over marled: such was the result in my experiment, it being upon land which had been so completely destroyed by over marling, that no other crop would grow; and when turned in, the land next year produced better corn than could have been expected. This year I intend sowing the seed in my corn field, preceding the last harrowing of the corn, on such land as is not intended for wheat, as the buckwheat would come up, to the annoyance of the wheat crop, if on land intended for that grain. I am induced to think it will grow tolerably with the corn, and benefit the land, which in the spring may be put in oats.

The buckwheat flour is apt to have grit. To avoid this, Mr. R—— suggested the idea of rolling it in a cask, through which a handle was placed. This idea struck me as good, and forthwith I proceeded to the experiment, and it succeeded, with some little improvement. I now divest it entirely of all grit. At first I hoped to get clear of the grit by placing it immediately after cutting, on a plank floor. This did not answer, as, from farther observation, I discovered the grit adhered to the capsule of the grain, which from winds was thrown there, and retained by the mucilaginous exudation on it—this being rubbed off by friction, and then passed through the fan, entirely divested it of any foreign substance. It is ground like other wheat.

Some experiments made by me this spring, in sowing gypsum on clover, have resulted in the full conviction, that marled land, which will produce clover of the weakest and most feeble growth, may be made to produce, by the addition of gypsum, clover fit for the scythe. If this be the case, to what state may we not advance our lands? And that it is the case, I have ocular demonstration. There is now under my eye a lot sown this spring in clover, a line of which through the centre was plastered—it is as evident as the back bone of a Rozinante, compared with his lank sides. The same benefit did not result upon clover sown the spring before, and plastered the time that sown this spring was. How to account for the difference, I know not. However, there was an evident advantage from the plaster on the clover a year old.

Buckingham C. H., July 26, 1833.

* * * I have just seen a *tomato*, [taken from Mr. G. H. Matthews' garden at this place,] weighing 22 *ounces*. He informs me that he can gather to-day 50 *that will weigh* 50 *pounds*. The tomato above spoken of was perfectly ripe and sound. If you *can beat this, we give it up*. I will procure you some of the seed, if you desire it.

The wheat harvest is about one half short in this neighborhood: corn crops fine.

Marengo, Alabama, July 30, 1833.

Your publication may meet with more encouragement about Tuscaloosa, owing to the soil, and its situation, in that country. The whole of the county of Tuscaloosa, and about half of Green county, adjoining, is a rich, light, soft loam, from three to nine inches deep, mixed with a large proportion of fine sand, and the whole has a remarkably broken or rolling surface, which causes this fine light soil to wash off most rapidly. You may now see large fields, which have been so recently cleared that the dead trees are still standing, from the one half of which the soil is already gone; so that unless the owners fall upon some plan to prevent its washing, and in some measure stop the constant cultivation, this must become, in a few years, one of the poorest sections of country in the union. Many of the gentlemen owing this land are now aware of those evils, and are trying to adopt measures that may arrest them. Our cane land is quite different, being much more level, and the soil much deeper, and constituted almost entirely of different ingredients. * * * We are just now raising, by subscription, funds to run a rail-road from Woodville, a small town, which is nearly at the extremity of the rich cane land, in one direction, to Demopolis, on the Warrior, where all our produce goes on board the steam boats for Mobile. If rail-ways are absolutely necessary for any country, it is this; for during the wet season, which is commonly from the first of January to the first of April, the roads through this rich soil are of tough tenacious mud, from one to three feet deep. Turnpike roads cannot be used, as gravel could not be obtained to construct them.

GUINEA GRASS.

Petersburg, August 20, 1833.

* * * From the description given, in the first volume of the American Farmer, of the

Guinea grass, and of its immense product per acre, I determined last spring to ascertain if our climate is genial to its cultivation. I therefore got a friend to procure me some seed, but they came to hand too late to sow, with any reasonable prospect of gain; however, I decided to make a trial, and accordingly I sowed a few seed in a box, also some in a small bed in my garden the latter part of June They vegetated tolerably early after sowing, and the grass looks well. So much am I pleased with it, I intend to procure more seed this winter, and sow them, or rather plant them, if practicable, between the 20th January and 10th February. If I succeed, I will send you some of the grass, when in a proper state for using green, also some after curing it.

MOTH-WEEVIL.

* * * * Do you know that if wheat is stacked in a *cool* day, and put into *large* stacks, that it will be free from weevil, or, in other words, the weevil will not hatch? Straw being a non-conducter, the heat does not penetrate *into a large stack*, and the wheat being put into the stack when *cool*, will remain so. You must know, too, that I am of the opinion of Mr. Smith of Scotland Neck, Halifax county, that the weevil is a vegetable insect, produced, not from the procreation of its kind, but a spontaneous creation. For ten years I had been ashamed to advance this opinion, but since I saw it asserted as the opinion of Mr. Smith, I find it is not new, though singular, and I may add, very extraordinary. * * *

It would be gratifying to many of our readers to have laid before them the reasons on which this opinion of Mr. Smith is founded—as well as those which support any of the other various and discordant opinions as to the mysterious origin of the moth-weevil. We know of some experiments now in progress, instituted for the purpose of throwing light on this subject, the result of which will be reported in the Farmers' Register.

[*Ed. Farm. Reg.*

QUERY TO RICE GROWERS—MARSH MUD.

Queen Ann's county, Maryland.

* * * * I understood that the rice growers of South Carolina and Georgia make a composition, which they lay on their floors upon which they thrash their rice, and which renders them hard and consistent. I should be glad to be informed, through the Register, what are its component parts. I have, for some years past, used Booth's machine for thrashing my wheat: it is a good machine, when in good order, but very liable to accidents. I saw a machine yesterday, in operation, made by Cooley in Philadelphia, which, I think, must be superior to all others. It has great strength and simplicity, and is portable without damage. Being used in the open air, a great desideratum is to give hardness and consistence to the floor, to prevent the adhesion of dirt to the wheat. * * * Our lands on Wye River were originally of the best quality, (not alluvion,) but have been exhausted by tobacco, which has been relinquished for some years past. By the application of marsh mud, I have increased my crops of corn and wheat fifty per cent. the first cultivation, but a few crops will exhaust it. I had used marl with great effect, but was not acquainted with its durable advantages till I read your book. Last winter I discovered in my low grounds some earth which, by the test you give of drying it and dropping it into a glass of water, proved to be what is esteemed marl in England. I carried out a few loads this spring, and should it prove valuable, I will make a communication of the result to the Register, as I doubt not it is to be found all through our country, and I should think also in Virginia.

BEES.

From Goodsell's Genesee Farmer.

If you should consider the following plain communication of facts worthy a place in your paper, you are at liberty to insert it, hoping that it may prompt some other person to convert a useless garret into a source of amusement and profit.

Much has been written of late respecting bees. Two years since I learned that bees might be kept to advantage in a garret. At that time I was building a stone house two stories high, and directed the mason to leave a hole in the end eight inches wide and one and a half high, the bottom level with the garret floor, having determined to give this method a fair trial. I delayed putting in the bees until I had a swarm last year. The swarm was first put into a hive twenty inches deep and ten in diameter. I placed this hive on the floor six inches from the wall, and about the same distance from the chimney, opposite the hole left in the wall. They nearly filled the hive last year, and this season they have not only completed the filling of the hive, but have filled the space between the hive and the wall, and also between the chimney and hive, and are now building on the outside of the hive opposite the chimney, and have raised the comb several inches above the hive. Although the bees have increased in numbers to that extent that they cover the wall for two feet above the hive, yet they continue to work well, and there is no appearance of their being disposed to swarm. I have one inconvenience with them: if a door or window is open at the end of the house, they sometimes enter by mistake, where they often remain, as Ulmus says, "butting their heads against the windows," until they fall down and die, if they are not turned out of doors. I have given the bees the whole of the garret, which is twenty-two by thirty-six feet: no light is admitted, except by the hole where they enter, which hole, I fear, may prove too small for them hereafter, should they continue to increase, as it now appears to be filled with bees passing in and out, but none are seen lying about the outlet, as is the case when the common hive is used.

LAWSON HARMON, JR.

Wheatland, July 29th, 1833.

STREW SALT OVER YOUR ASPARAGUS BEDS.

The asparagus is a native of the shores of the ocean, and will bear so much salt without being injured, that most of the weeds that infest the beds may be destroyed in this manner. But the application has other advantages; salt is a valuable manure; and it also repels insects by its pungency; for, though we know of none that feeds on the Asparagus, there are many that would otherwise *poach* and lessen the fertility of the soil.

[*Maine Farmer.*

FLOUR TRADE OF THE UNITED STATES.

Inspection of wheat and rye flour and corn meal in the principal ports of the United States for the year 1831, compared with the preceding ten years.

Places.	Wheat Four.	Rye Flour.	Corn Meal.	
	Barrels.	Bbls.	Hhds.	Bbls.
Albany, New York..	48,653	....	....	....
New York.....	928,280	9,222	9,951	24,076
Philadelphia	474,076	24,757	7,970	23,015
Baltimore	555,136	3,318	416	7,092
Georgetown, D. C....	194,975	30	....	....
Alexandria, D. C.....	193,735	75	....	....
Fredericksburg, Va...	74,227	....	....	....
Falmouth, Va.....	51,309	....	....	....
Richmond, Va.....	183,768	....	....	....
Petersburg, &c.....	52,386	....	....	....
New Orleans, year ending Sept. 30....	360,580	....	....	2,313
Total, 1831.....	3,117,125	37,399	17,337	56,496
1830.....	2,851,876	41,351	18,372	35,070
1829.....	2,255,132	77,945	17,891	51,666
1828.....	2,245,257	55,239	19,178	78,958
1827.. ...	2,061,459	34,487	16,869	51,192
1826.....	2,031,558	27,282	18,619	36,979
1825.....	1,882,611	57,419	14,781	51,297
1824.....	1,714,410	68,380	17,192	70,415
1823.....	1,557,724	75,620	14,705	36,863
1822.....	1,599,973	59,363	15,157	32,274
1821.....	1,707,350	43,976	17,449	40,693

Comparative inspection of wheat flour in the principal districts for seven years.

YEARS.	Albany and N. York.	Philadelphia.	Baltimore.	Virginia and Dist. Col.	New Orleans
1831	976,933	474,076	555,136	750,400	360,580
1830	870,585	473,876	597,804	775,911	133,700
1829	705,175	297,206	473,604	621,824	157,323
1828	686,704	333,764	546,450	525,746	152,593
1827	652,032	351,517	572,759	*381,055	131,096
1826	527,700	342,250	596,348	436,168	129,094
1825	446,611	294,289	510,425	490,740	140,546

* Falmouth omitted.

Quantities of flour and grain exported from the United states, from Oct. 1, 1821, to Sept. 30, 1831, inclusive.

YEARS	Wheat Flour.	Rye Flour.	Corn Meal.	Wheat.	Corn.
	Barrels.	Barrels.	Barrels.	Bushels.	Bushels.
1831	1,805,205	19,049	204,206	405,384	566,761
1830	1,225,881	26,298	145,301	45,289	444,107
1829	837,385	34,191	173,775	4,007	897,656
1828	860,809	22,214	174,639	8,906	704,902
1827	865,491	13,345	131,041	22,182	978,664
1826	857,820	14,472	158,625	45,166	505,381
1825	813,906	29,545	187,285	17,960	869,644
1824	996,792	31,879	152,723	23,373	779,297
1823	756,702	25,665	141,501	4,272	749,034
1822	827,865	19,971	148,288	4,418	509,098
1821	1,056,119	23,523	131,669	25,812	607,277

Statement of the quantity and destination of wheat flour exported from the United States, commencing 1st October, 1821, and ending 30th September, 1831.

	AMERICA.			EUROPE.					Africa.	Asia.	TOTAL.
YEARS	British N. Amer. Provin.	West Indies.	South America	Great Britain & Ireland.	France.	Spain and Portugal.	Madeira.	Other parts of Europe.	All parts.	All parts.	Barrels.
1831	150,645	371,876	319,616	879,430	23,991	364	12,811	35,416	2,751	8,305	1,805,205
1830	149,966	281,256	347,290	326,182	56,590	10,222	9,628	36,924	2,609	5,214	1,225,881
1829	91,108	248,236	235,591	221,176	17,464	509	3,779	14,959	221	4,362	837,385
1828	86,680	370,371	308,110	23,258	6,265	294	4,061	54,371	1,737	5,662	860,809
1827	107,420	362,674	271,524	53,129	19	4,293	5,171	52,114	4,909	7,238	865,491
1826	72,904	433,094	285,563	18,357	275	504	6,119	27,716	5,403	7,885	857,820
1825	30,780	429,760	252,786	27,272	102	730	3,597	55,818	7,623	15,438	813,906
1824	39,191	424,359	357,372	70,873	426	939	25,851	47,449	3,883	6,439	996,792
1823	29,681	442,468	198,256	4,252	51	62,387	4,752	2,088	903	11,864	756,702
1822	89,840	436,849	211,039	12,096	228	25,104	21,375	976	3,929	26,429	827,865
1821	131,035	551,396	156,888	94,541	1,175	71,958	26,572	9,074	3,123	10,357	1,056,119

TULIPOMANIA IN HOLLAND, AND IN VIRGINIA.

[Extract from Depping's Evening Entertainments.]

Before we have done with the interesting history of the commerce of past ages, I will give you some account of a very curious kind of traffic, which was for some time in fashion in Holland, and even produced a sudden kind of revolution in that country. These particulars will convince you of the truth of my observation, that men rarely know how to keep within the bounds of moderation, and too frequently fall into reprehensible excesses. Fortunately, the instance that I am about to adduce was of less consequence than those which I have already related, and only shows the absurdity of men when under the influence of any prevailing fashion or folly.

Among the native productions of the east, introduced into Europe by means of its relations with India, was a flower which the Turks called *tulibant*, and which received in England the appellation of *tulip*. It appears to have been well known in this part of the world so early as the middle of the sixteenth century. These flowers, you know, though of every variety of color, are not the greatest ornaments of our gardens, being surpassed by many others in beauty and fragrance. Nevertheless, the tulip, about a century after its transplantation into Europe, acquired a consideration which no other flower ever obtained; so that it was valued far above even the most precious metals. The lovers of flowers seemed to be seized with a sort of madness, which has been aptly denominated *tulipomania*. I shall endeavor to give you a clear and simple explanation of the folly which this word de-

notes, and of which there are but few parallels. It was from 1634 to 1637 that the tulipomania raged in Holland, particularly at Harlaem, Amsterdam, Utrecht, Alkmaer, Leyden, Rotterdam, Horn, Enkhuysen, and other places. In those years tulips rose to enormous prices, and enriched many speculators. The florists held in particular estimation certain species, to which they gave particular names, and which they sold dearer than others. A single root of the variety called *viceroy* produced the owner four fat oxen, eight hogs, twelve sheep, ten hundred weight of cheese, two pipes of wine, a bed and furniture complete, a silver cup, a great quantity of corn, and other provisions, to the value of twenty-five thousand florins.

These roots were sold by weight, like the most valuable commodities; an ounce often cost several thousand florins; the most esteemed variety was that called *semper augustus:* it was valued at two thousand florins, and reported to be so rare that there were but two roots of the kind; one at Harlaem, and the other at Amsterdam. A flower-fancier offered for one of these, four thousand six hundred florins, and a fine coach and two horses into the bargain. Another person gave twelve acres of land for a root. In 1637, the collection of tulips of one individual, was sold, after his death, by his heirs, for the enormous sum of nine thousand pounds; one single *semper augustus* sold for two thousand florins.

Every body's head was turned by the passion for tulips; those who had not ready money, bartered away their lands and houses to procure them. The florists, and other persons who were engaged in the cultivation of flowers, in a very short time made immense fortunes. All classes of society were therefore desirous of embarking in the trade; and all the Dutch, from the first gentleman in the land to the chimney sweeper and rag man, began to speculate on the tulipomania. A bed of tulips was considered the greatest treasure that a person could possess, and was worth at least as much as the most magnificent palace. It is related, that a sailor, having brought some goods to a merchant who cultivated tulips in his garden for this speculation, received from the latter a herring for breakfast. As he was going away with it, he saw some roots in the garden; and thinking they were common onions, he began quietly eating them with his herring. At this moment the merchant came up, and perceiving what he was about, "Villain!" cried he, in a tone of despair, "your breakfast has ruined me; I could have regaled a monarch at half the expense." The poor sailor, as you may suppose, was in the utmost astonishment; and it was not without difficulty that he was made sensible of his mistake.

The rapid increase of private fortunes made people neglect every thing to engage in the speculations of the moment. The taverns and alehouses resembled little exchanges; bargains were there concluded in the presence of notaries and witnesses for a few tulip roots; and in general, these negotiations, which were transacted with the utmost gravity, were followed by splendid entertainments. It has been calculated, that in one single town of Holland the dealings in tulips amounted in three years to ten millions of florins. It should be observed, however, that those who carried on this traffic did not cultivate the flowers, but only bought and sold; and it was frequently the case that neither the buyer nor the seller ever saw the tulips for which they bargained. Others engaged to supply roots, which in fact they never furnished: before the flowering season, arrangements and negotiations were concluded for the sale and purchase of more tulips than perhaps all the gardens in Holland contained. There existed, as I have told you, but very few flowers of the variety called *semper augustus;* and yet no other kind was so frequent in commerce is that. A gentleman would perhaps buy of a chimney sweeper two thousand florins worth of tulips, and sell them again to a farmer at a still higher price; and yet none of the three ever had the tulips, or thought of obtaining possession of them. It was not properly speaking in tulips that they trafficked, but in money. Had the rarity and beauty of the tulips been the object of this trade, people would have bestowed the utmost attention on the cultivation of that flower: they would have gone to its native country, the east, and sought the most beautiful species all the world over; but, instead of this, the speculators never quitted their alehouse, and enriched themselves by an extraordinary kind of jobbing—the whole secret of which was this:

Suppose a dealer engaged to furnish a gentleman at the expiration of six months with a tulip root of any particular sort, for the sum of a thousand florins; at the expiration of the time agreed upon, the price of that variety was neither higher or lower, or perhaps the same as before. If the current price of one thousand florins had meanwhile risen to fifteen hundred, the gentleman did not demand his tulip, but the dealer was obliged to pay him five hundred florins in cash; but if the price was lower than at the time of making the bargain, say eight hundred florins, the gentleman on the contrary, paid the dealer the sum of two hundred. If, however, the tulips were neither dearer nor cheaper at the end of six months, neither party lost or gained, and their contract was at an end. Every thing depended on the price current, by which they regulated their agreements and bargains; and the dealers were as anxious to know the prices of tulips every day, as people are with us to inquire the prices of stocks. It frequently happened, that the same person gained of one and lost to another; and if he had no cash to pay his debts, he referred his creditors to those who had lost to him; so that plenty of business might be transacted without tulips, and even without money. As every body was desirous of participating in this kind of stock-jobbing, the rich speculated on the rarest species, while the bargains of the lower classes were confined to the most common sorts. Taking all circumstances into consideration, this commerce in tulips, or rather tulipomania, was in reality a game of chance, by which all were at first seduced by the immense profits to be derived from it; but as these speculations possessed only a fictitious lustre, and had no solid foundation, the gamesters were at length undeceived, and learned, to their cost, that excessive cupidity generally makes dupes of those by whom it is harbored, and that labor and industry are the surest road to fortune.

Nations and individuals, who apply themselves to commerce, cannot, I repeat it, hope for prosperity, except from industry and frugality. To conclude the history of the tulipomania, I shall add, that in a few years the rage for speculations rose to such a height that most of those who engaged in

them were at length unable to fulfil their contracts. Others squandered the wealth which they had so easily acquired; whilst others again more discreetly relinquished the traffic, and would no longer subject their property to continual risk. The price of tulips fell lower and lower; the sellers, to avoid utter ruin, offered the buyers natural tulips, but the latter would not have them. Hence arose numberless squabbles and law suits; the tribunals refused to decide these complicated affairs; and the speculators were obliged to abate their extravagant demands, and to take what they could get. Many were ruined, and had unfortunately conceived an aversion to their original occupations which had furnished them with the means of a comfortable subsistence. Accustomed to indolence and reverses of fortune, they chose rather to live in penury than to return to their former employments. The eyes of all were at length opened, and many people became sensible of their folly and shame, at the expense of their property and peace of mind.

At the beginning of the last century a game of chance of the like nature was introduced into France, by a man named Law, a Scotchman, who had gained the confidence of government by exhibiting a plan which was greatly to benefit the finances of the state. He was appointed director of a company of merchants trading to Louisiana in America, and he opened a bank at Paris. By spreading a report that gold and silver mines had been discovered in Louisiana richer than those of Peru, he roused the spirit of cupidity; every one hastened to partake of the working of these mines; shares were purchased with avidity, and this speculation became in the end an insatiable passion. The price of the shares rose from five hundred francs to a thousand: fresh shares were now offered—misers themselves could not resist the temptation, exchanging their treasures against bits of paper, which were to produce wealth without end. All ranks of the nation speculated; Law was looked up to as a universal benefactor; no private individual had ever enjoyed so large a share of consideration: a single audience with this banker was talked of as an important circumstance in a man's life. This mania extended to the provinces—the country people flocked to Paris to partake of the happiness of the Parisians; the bank was besieged from morning till night; but, as the treasures for which they exchanged their solid gold for that in the mines of Louisiana arrived not, the confidence of the people began to be shaken. They became anxious to dispose of their paper shares; but as every body nearly possessed more or less of these valueless tickets, there were no purchasers. The bank was then beset, not for paper shares, but for money; and Law, after having been flattered, blessed, and courted, was compelled to a disgraceful and hasty flight. It was now perceived, that instead of lightening the burthens of the state, it had indeed added to them. This being the case, government had recourse to other and more substantial means. But the failure of this scheme did not prevent the French, in imitation of our bank notes, resorting to a plan of the same kind during the revolution. They issued *assignats;* but the nation in general was not to be so readily duped a second time: some few persons were ruined, some few made their fortunes, but the assignats were quickly withdrawn from circulation. A few have been saved as curiosities, and as a melancholy remembrance of the unhappy epoch.

The foregoing account of the celebrated *Tulipomania*, (of which every one has heard something, but of which so little of the truth is known,) is extracted from a work prepared for the amusement of children; but it may also serve for the instruction, and as a fit subject for the reflection of men. Most of us have wondered at the ridiculous madness of the Hollanders when they paid large sums for a single tulip root: but if we view things fairly, their madness was of the same kind, and not greater than has sometimes raged in other countries and even in our own. The high prices offered and paid for tulips were not graduated by an estimation of their intrinsic value, but by the expected increase of price, and the consequent profit to the purchaser. When a flower had risen in price from one florin to five hundred, the immense profits thereby gained still more stimulated avarice and the spirit of speculation, and there was a continually increasing impulse to swell these exorbitant prices, until the bubble was obliged to burst from excess of distention. The Mississippi stock in France, and the South Sea, and recently the South American mining stocks in England, rose and fell precisely for the same reasons: and much the greater part of the value of those stocks was as fictitious, and baseless, as were the prices of Dutch tulips.

Have *we* always been wiser than the tulip speculators of Holland?

The enormous and fraudulent issues of paper money during the war of 1812, from banks refusing and unable to pay specie, (which were in fact *bankrupt*, and yet were the legalized manufacturers of the national currency without limit,) served to make an apparent *appreciation* of property, by what was truly only a depreciation of money. When a dollar was worth only half of its former value, it followed necessarily than an article would sell for two dollars which before sold for one, and yet be no dearer than before. Yet intelligent and experienced men of business, as well as those the most deficient in such qualities, fell into and acted under the delusion that land suddenly doubled in value, and every one hastened to get rich by buying a kind of property which was every day increasing in price. No where was this ruinous spirit of speculation, this madness carried farther than in and near Richmond. When a purchaser paid $10,000 for a few vacant lots in the suburbs, or for a few hundred acres of barren and worthless Henrico land, which were totally unproductive of present or prospective profits, but had increased ten fold in price within twelve months, the probability of the continued rise of price was the value considered, and not the intrinsic value of the land. The same number of acres of rock, or of quagmire, would have equally served the purpose, and the madness of speculation; and tulip roots as well as either. To buy and sell for $10,000 a piece of land which no man could suppose could yield a profit on $1000, was certainly as mad, and as ridiculous, as to estimate at $9,000 a tulip root, which could yield nothing.

HINTS TO HOUSEWIVES.

Vessels intended to contain liquid of a higher temperature than the surrounding medium, and to keep that liquid as long as possible at the highest

temperature, should be constructed of materials which are the worst radiators of heat. Thus tea-urns and tea-pots are best adapted for their purpose when constructed of polished metal, and worst when constructed of black porcelain. A black porcelain tea pot is the worst conceivable material for that vessel, for both its materials and color are good radiators of heat, and the liquid contained in it cools with the greatest possible rapidity. On the other hand, a bright metal tea-pot is best adapted for the purpose, because it is the worst radiator of heat, and therefore cools as slowly as possible. A polished silver or brass tea urn is better adapted to retain the heat of the water than one of a dull brown color, such as is most commonly used. A tin kettle retains the heat of water boiled in it more effectually, if it be kept clean and polished, than if it be allowed to collect the smoke and soot, to which it is exposed from the action of the fire. When coated with this, its surface becomes rough and black, and is a powerful radiator of heat. A set of polished fire irons may remain for a long time in front of a hot fire, without receiving from it any increase of temperature beyond that of the chamber, because the heat radiated by the fire is all reflected by the polished surface of the irons, and none of it is absorbed; but if a set of rough, unpolished irons, were similarly placed, would become speedily so hot, that they could not be used without inconvenience. The polish of fire irons is, therefore, not merely a matter of ornament, but of use and convenience. The rough, unpolished poker, sometimes used in a kitchen, becomes speedily so hot that it cannot be held without pain. A close stove, intended to warm apartments, should not have a polished surface, for in that case it is one of the worst radiators of heat, and nothing could be contrived less fit for the purpose to which it is applied. On the other hand, a rough, unpolished surface of cast iron, is favorable to radiation, and a fire in such a stove will always produce a most powerful effect.—[*Cabinet Cyclopædia—Dr. Lardner on Heat.*

RULES FOR TRAVELLERS, AND THEIR HORSES.

From the Southern Planter.

1. In the first place treat your horse like a sensible creature; (I have seen horses that had more intelligence than the dolts that rode them)—in correcting him address yourself to his understanding, and endeavor to convince him by reason.—The *forcible* remedy comes with more power afterwards.

2. Never beat your horse without sufficient cause, as that irritates and spoils his temper. Gentle words to a horse's ear are like lumps of sugar to his mouth—they sweeten his disposition.

3. If your horse take a *scare*, as the best of horses sometimes will, don't thrust your spurs into his flanks or beat him over the head. Nobody knows a horse's reason for being frightened, he sees many things we little dream of. Balaam's horse (or mule, I forget which,) saw an angel! other horses, for aught we know, may see as much.

4. If a horse stumbles, speak to him sharply, or give him a jerk or two with the bridle, just to apprise him that he is watched, but do not strike him--it makes him stumble the worse.

5. A horse is fond of company. Therefore, when riding alone, you should talk, sing or whistle to him. If in Spanish, so much the better—most horses have an ear for Spanish. (Horses procured from the Pony Club, probably understand Cherokee quite as well.)

6. Never carry liquor on your journey: a horse can't stand the smell of ardent spirits: I never knew a man who carried a tickler that had good horses—they invariably become wind broken, or foundered.

7. Don't start too soon in the morning. There is nothing gained in a long journey by hurrying away before breakfast. Let your beast have time to rest and fill himself before starting—he can then travel till night without another feed.

8. When your horse is full and stiff, as he will be in the morning or after eating, never ride out of a walk—towards evening, as he becomes empty, his pace may be accelerated, without injury.

9. As nothing is gained by starting too soon in the morning, neither is any thing made by riding too late in the evening. Never ride after night when it can be avoided. A horse likes regular meals and regular sleep, as well as other honest creatures, and is entitled to them.

10. See after your horse yourself—see that he is well fed, watered, rubbed and lodged. Don't let him stand in the mud, nor on a plank floor, when it can be avoided. A dry dirt floor, with a plenty of clean straw over it, is the best bed for a horse.

11. Never ride your own horse, when you can borrow your friend's or neighbor's—especially if you want to travel fast. A horse that knows you, wont push himself like one that does not.

PINE KNOT.

METHOD OF GENERATING NEW VARIETIES OF FRUIT.

From the Horticultural Register.

After selecting a few conveniently situated branchlets, in different parts of a tree, I remove all the blossoms, with the exception of three or four of the most promising, from which, a day or two before their expansion, I extract the anthers with a small pair of scissors, or tweezers, and cover each branchlet with a piece of thin gauze, taking care that no opening be left by which bees, flies, or other insects, might gain admission, and thereby mar the experiment by bearing to the stigma the pollen of some variety other than the one I may desire to employ. The gauze should also be rendered secure, so that the wind may not partially open it, nor entirely carry it away. When the blossoms are fully expanded, and the stigma, by bursting, is ready to receive the influence of the pollen, it must be supplied by the application of a flower of whatever variety has been fixed upon as the male parent, and the gauze replaced till the fruit is set. As the fruit increases in size, if more than one or two remain, judge which gives the best promise of attaining perfection, and the rest remove; it will be advisable to distinguish each branch by a label affixed. The above, or some similar method, alone can determine, with any certainty, which is the male parent; or, indeed, there may be many, which accounts for the diversity of the products obtained from seeds of the same individual fruit.

Last year I gathered the first produce of some seedling strawberries, raised by cross fertilization in a similar manner; and am looking forward to

the result of subsequent experiments, which, from the success I have already attained, leads me to believe will prove highly satisfactory. Two or three of the varieties obtained, (but one more especially,) possess excellent properties of growth, fecundity and flavor, and differ remarkably from any previous one which has come under my observation.

Throughout the vegetable kingdom, it is found that there is a certain point or degree of ramification more or less in different individual members, removed from the parent stem, previous to the attainment of which a plant is incapable of putting forth fruit blossoms; the cause of this it were difficult to explain satisfactorily. Having ascertained the numerical amount of this requisite degree of ramification, in conjunction with a knowledge of the habits of the plants, as to the number of successive shoots it protrudes in the course of the year, we may form a pretty accurate estimate of the length of the time required before it shall attain to a fruit-bearing state.

Thus, other circumstances remaining the same, the oak, did it not send forth two shoots, the one in spring, the other in autumn, would be double the long period it now is ere it began to produce acorns. The exact number, however cannot be ascertained, since all traces by which they might be computed are, in the older portions of the wood, entirely lost. It is by earlier inducing *this* degree in the melon, which is generally the second from the main stem, that the pruning, or stopping, is effective towards the accelerating of the emission of fruit blossoms.

In the apple the twelfth, and the pear the eighteenth, are about the minimum number of degrees of ramification distant from the parent stem, that are required ere flowers are put forth; that period, however, is often protracted. In computing these numbers a shoot, succeeding after a quiescent period, whether still projected in a line with the older wood, or at an angle from it, is equally considered as a distinct branch; there is, indeed, a knot at the junction, as much of the one as the other; and it is the number of these knots, by retarding the flow, or causing the accumulation of the sap, which would appear to bear some part in effecting a fruitful state. From these circumstances the inference to be drawn is, that if we can cause the formation of three or four successive shoots in the course of the year, instead of one, or at the most two, (as would be the case, were the tree left to its natural growth,) that we shall thereby anticipate, by a half or two-thirds, the usual period of fructification.

With this aim, then, it will be necessary to maintain the young seedlings, by due care and judicious culture, in a vigorously growing state, and two or three times, or even oftener, as the circumstances may warrant, nip off or prune back the leading shoot, whereby at each operation a new branch will be protruded, which otherwise would not have been the case, until the succeeding spring. By a continual repetition, however, of these operations, an inconvenient number of diverging shoots will also be excited; consequently attention must be paid to regulating their number, by disbudding the branches accordingly, which will also infuse more vigor into those remaining. It will not be advisable to continue the stopping far into the season, otherwise the young wood will not have time to ripen; and the frosts of winter, by killing the new-formed portions, will counteract the advantage obtained. By duly following this method, the usual period of fructification will be shortened with the apple, to and from the fifth to the seventh year, instead of the twelfth to the twentieth, and the pear in like proportion.

ROTATION OF CROPS.

From the Encyclopedia of Agriculture.

Growing different crops in succession is a practice which every cultivator knows to be highly advantageous, though its beneficial influence has not yet been fully accounted for by chemists. The most general theory is, that though all plants will live on the same food, as the chemical constituents of their roots and leaves are nearly the same, yet that many species require particular substances to bring their seeds or fruits to perfection, as the analysis of these seeds or fruits often afford substances different from those which constitute the body of the plant. A sort of rotation may be said to take place in nature, for perennial herbaceous plants have a tendency to extend their circumference, and rot and decay at their centre, where others of a different kind spring up and succeed them. This is more especially the case with travelling roots, as in mint, strawberry, creeping crowfoot, &c.

The rationale of rotation, is thus given by Sir H. Davy. "It is a great advantage in the convertible system of cultivation, that the whole of the manure is employed: and that those parts of it which are not fitted for one crop, remain as nourishment for another. Thus, if the turnip is the first in the order of succession, this crop, manured with recent dung, immediately finds sufficient soluble matter for its nourishment; and the heat produced in fermentation, assists the germination of the seed and the growth of the plant. If, after turnips, barley with grass seeds is sown, then the land, having been little exhausted by the turnip crop, affords the soluble parts of the decomposing manure to the grain. The grasses, rye-grass and clover remain, which derive a small part only of their organized matter from the soil, and probably consume the gypsum in the manure, which would be useless to other crops: these plants, likewise, by their large systems of leaves, absorb a considerable quantity of nourishment from the atmosphere; and when ploughed in at the end of two years, the decay of their roots and leaves affords manure for the wheat crop; and at this period of the course, the woody fibre of the farm yard manure, which contains the phosphate of lime and the other difficultly soluble parts, is broken down: and as soon as the most exhausting crop is taken, recent manure is again applied. Peas and beans, in all instances, seem well adapted to prepare ground for wheat; and in some rich lands they are raised in alternate crops for years together. Peas and beans contain a small quanity of a matter, analogous to albumen; but it seems that the azote, which forms a constituent part of this matter, is derived from the atmosphere. The dry bean leaf, when burnt, yields a smell approaching to that of decomposing animal matter; and in its decay in the soil, may furnish principles capable of becoming a part of the gluten in wheat. Though the general composition of plants is very analogous, yet the specific difference in the products of many of them, proves that they must derive different materials

from the soil; and though the vegetables having the smallest system of leaves will proportionably most exhaust the soil of common nutritive matter, yet particular vegetables, when their produce is carried off, will require peculiar principles to be supplied to the land in which they grow. Strawberries and potatoes, at first, produce luxuriantly in virgin mould, recently turned up from pasture; but in a few years they degenerate, and require a fresh soil. Lands, in a course of years, often cease to afford good cultivated grasses; they become (as it is popularly said) tired of them; and one of the probable reasons for this is, the exhaustion of the gypsum contained in the soil."

The powers of vegetables to exhaust the soil of the principles necessary to their growth is remarkably exemplified in certain *funguses*. Mushrooms are said never to rise in two successive seasons on the same spot; and the production of the phenomena called fairy rings, has been ascribed by Dr. Wollaston to the power of the peculiar fungus which forms it, to exhaust the soil of the nutriment necessary for the growth of the species. The consequence is, that the ring annually extends; for no seeds will grow where their parents grew before them, and the interior part of the circle has been exhausted by preceding crops; but where the fungus has died, nourishment is supplied for grass, which usually rises within the circle, coarse, and of a dark green color.

A rotation is unnecessary, according to Grisenthwaite; and, in a strict chemical sense, what he asserts cannot be denied. His theory is a refinement on the common idea of the uses of a rotation stated above; but by giving some details of the constituent parts of certain grains and certain manures, he has presented it in a more clear and more striking point of view than has hitherto been done. To apply the theory in every case, the constituent parts of all manures and of all plants, (1st, their roots and leaves; and, 2dly, their seeds, fruits, or grains,) must be known. In respect to manures this is the case, and it may be said to be in a great degree the case as to the most useful agricultural plants; but, unfortunately for our purpose, the same cannot be said of garden productions in general, though no branch of culture can show the advantage of a rotation of crops more than horticulture, in the practice of which it is found that grounds become tired of particular crops, notwithstanding that manures are applied at pleasure. If the precise effects of a rotation were ascertained, and the ingredients peculiarly necessary to every species pointed out, nothing could be more interesting than the results of experimental trials; and whoever shall point out a simple and economical mode by which the potato may be grown successively in the same soil, and produce annually, neglecting the effects of climate, as dry and well-flavored tubers, or nearly so, as they generally produce the first and second years on a new soil, will confer a real benefit on society. That wheat may be grown many years on the same soil, by the use of animal manures, or such as contain gluten, Grisenthwaite's theory would justify us in believing chemically; and it ought to be fairly tried by such cultivators as Coke and Curwen. Till this is done in the face of the whole agricultural world, and the produce of every crop, and all the particulars of its culture accurately reported on annually, the possibility of the thing may be assented to from the premises, but will not be acted on; and, in fact, even the best agricultural chemists do not consider that we are sufficiently advanced in that branch of the science to draw any conclusion, *a priori*, very much at variance with general opinion, and experience. It should always be kept in mind, that it is one thing to produce a crop, and a different thing to grow crops with profit.

The principles of rotation of crops are thus laid down by Yvart and Ch. Pictet, (*Cours complet d'Agriculture*, articles *Assolement*, and *Succession de Culture*, and *Traité des Assolemens*. Paris, 8 vol.)

The *first principle* or fundamental point is, that every plant exhausts the soil.

The *second*, that all plants do not exhaust the soil equally.

The *third*, that plants of different kinds do not exhaust the soil in the same manner.

The *fourth*, that all plants do not restore to the soil the same quantity, nor the same quality of manure.

The *fifth*, that all plants are not equally favorable to the growth of weeds.

The following consequences are drawn from these fundamental principles:

First. However well a soil may be prepared it cannot long nourish crops of the same kind in succession, without becoming exhausted.

Second. Every crop impoverishes a soil more or less, according as more or less is restored to the soil by the plant cultivated.

Third. Perpendicular rooting plants, and such as root horizontally ought to succeed each other.

Fourth. Plants of the same kind should not return too frequently in a rotation.

Fifth. Two plants, favorable to the growth of weeds, ought not to succeed each other.

Sixth. Such plants as eminently exhaust the soil, as the grains and oil plants, should only be sown when the land is in good heart.

Seventh. In proportion as a soil is found to exhaust itself by successive crops, plants which are least exhausting ought to be cultivated.

Influence of rotations in destroying insects.—Olivier, member of the Institute of France, has described all the insects, chiefly tipulæ and muscæ, which live upon the collar or crown of the roots of the cereal grasses; and he has shown that they multiply themselves without end, when the same soil presents the same crop for several years in succession, or even crops of analogous species. But when a crop intervenes on which these insects cannot live, as beans or turnips, after wheat or oats, then the whole race of these insects perish from the field for want of proper nourishment for their larva. (*Mem. de la Société Royale et Centrale d'Agr. de Paris*, vol. vii.)

APPLE SEED.

The best time to sow apple seeds is in autumn, immediately after they have been taken from the fruit; for if delayed till spring the greater part will be found to have lost their germinating power. But if it is determined to keep them, they must be mixed with sand and closed from the air; this occasions considerable trouble, if the pippins of different varieties, as they always should be, are preserved distinct.—*New England Farmer.*

Extracts from the Foreign Quarterly Review.

DE CANDOLLE'S VEGETABLE PHYSIOLOGY.

The process used by nature to heal the wounds of trees—theory of pruning.

As these details are somewhat foreign to the specific object of this work, we shall not dwell upon them, but pass on to a subject more strictly physiological in some of its details, and of nearly equal importance in the practical results which it involves—we mean the process employed by nature in healing whatever wounds trees may receive externally. It is upon this that the whole success of pruning rests, and we shall the more willingly dwell upon the subject, as it is one which has lately given rise to considerable discussion, it having become a matter of doubt among some extensive landed proprietors of this country, whether the old system of "close prunning" has not been productive of immense damage to our forests, and whether it ought not to be entirely laid aside in favor of another system, which has been termed "fore-shortening." These inquiries appear to have originated from an examination of the effects which are always produced in timber whenever a branch is cut off close to the trunk of the tree; and it is rightly asserted, that wherever this has been done, a complete solution of continuity exists between the old wood and that which had been formed over the wounded surface; and that in many cases, though by no means in all, decay and rottenness have been introduced to a greater or less extent into the very heart of the tree. Where the pruned branch is large, the blemish thus introduced is proportionably great, and must always diminish the value of the timber, even though it should not have caused the introduction of any rottenness.—But although such, it must be allowed, are undeniably the bad effects of close pruning, it does not follow that the proposed alternative of fore-shortening is any way preferable to it; and we shall first consider the mode in which all wounds are healed over, and then examine the question whether the damage produced by fore-shortening is more likely to be counteracted by the subsequent efforts of vegetation than those which are introduced by close pruning.

Whenever the stem is wounded by the removal of a portion of the bark, and the wood becomes exposed to the action of the atmosphere, a double influence is exerted in gradually decomposing its texture: one arises from the union of its carbon with oxygen, as in the ordinary process of decomposition; and the other from the humidity by which it is penetrated, dissolving some parts of the tissue, and in reducing it generally to a soft and disorganised state. These results will of course be very different according to the nature of the wood attacked, and to the length of time that the wound requires to be healed over. As soon, however, as the wood is secured from further exposure to the atmosphere, the damage ceases to increase, though the blemish which has been introduced admits of no remedy. The new wood and bark which form over the wound, are derived from the growth of the alburnum and liber, which gradually extend themselves from its upper edge, and from along each side, till they meet in the middle and then unite and blend together as in the case of grafting. By judiciously splitting a rock vertically at the zone which corresponds to that year's growth in which the surface of a pruned branch was covered over by the fresh wood, every mark of the pruning knife will be found on the discolored surface of the old wound, as fresh as when it was first impressed upon it, and the new wood will have received a reverse impression of this surface as accurately as a counter receives the stamp of a die. Vertical wounds on the surface of the trunk are those which heal the most readily, because their direction tallies with the course of the cambium, which soon forms a tumor at the upper extremity of the wound and down each side, in the manner just described; and this is more readily extended over the wound in proportion as its surface is smoother. Various composts are useful for protecting the exposed surface from the atmosphere, whilst the healing process is in progress: but nothing of an oily or poisonous description should be employed. Whenever, therefore, pruning is absolutely necessary, it is advisable to prune close, in order to reduce the exposed surface to the condition of a vertical wound; unless, indeed, the limb be very large, when it may be more advisable to prune at some little distance from the trunk, lest the blemish which would be introduced into the timber should be so considerable as to more than counterbalance any advantage that would be obtained. There is no direct means by which a transverse section through the wood may be healed over, and if a branch be lopped at a distance from its point of union with a main branch, or with the trunk itself, the exposed surface never heals over, but causes the decay and death of the branch for some distance back, until this is stopped at some spot where the returning sap is in sufficient quantity to produce fresh wood and bark. The system of "fore-shortening" rests upon the gradual decay of the pruned branch, until it be ultimately killed by the increasing shade of the superior branches, when its fall will take place in the natural way; as in all branches which grow low upon the stem, and are early stifled by the shade of the upper branches, and which slough off, without producing any very marked blemish in the heart of the tree. Here, however, we must observe, that there is no process for "sloughing off" the decayed parts of vegetables which at all resembles that which takes place in animals; but when the branch has become so completely rotten, as to fall off upon the application of the slightest force, it will be found that the new bark and alburnum which are formed round the base of its stump, always envelope more or less of the rotten wood, which forms a rough and jagged surface to the wound. It is erroneous to suppose that those branches which fall off by a sort of natural pruning, resulting from their being killed by an obstruction of the light, leave comparatively little or no trace of their decay in the heart of the tree; but since it happens that those branches which perish early are always proportionably small, when compared with the bulk to which the trunk attains, the blemishes which they leave may easily be underrated, and this we believe to have been the origin of the error which supposes that the blemish introduced upon the natural decay and fall of a branch is, *ceteris paribus*, of less consequence than that which results upon closely pruning it. The danger which attends all pruning may be diminished by paying attention to a few rules, such as cutting the surface quite smooth, cutting it obliquely so as to prevent the wet from

lodging upon it, and especially by cutting close to the main branch or stem. The main object is to procure a rapid developement of the new wood, in order that the exposed surface may be secured as speedily as possible from the action of air and moisture; and this, we believe, is best obtained by reducing the cut as nearly as possible to the condition of a vertical wound on the stem. All pruning, then, should be avoided as much as possible; but where it is absolutely necessary, it should be performed as soon and as completely as the young plant or branch may bear it with safety.

The action of poisons on vegetable structure.

The action of poisons on vegetables is analogous to that which they produce on animals. One class is corrosive, and destroys the tissue on which it acts; whilst another class is narcotic, and destroys vitality without producing any decided alteration on the tissue itself. It has peen ascertained that nearly all substances which are poisonous to animals, are likewise so to vegetables, though the intensities of their several actions are different in the two kingdoms; but besides these, there are many substances innoxious to animals, which are destructive to vegetable life. In fact, it should seem that almost every thing that vegetables can imbibe is injurions to them, excepting water, the insipid earthy salts, carbonic acid, and other gases, gums, and mucilaginous substances, and finally, certain animal matters when introduced in very weak solution. It has been supposed that the presence of a nervous system might be assumed to exist in vegetables, from the mode in which they are destroyed by narcotic poisons; but there is this remarkable difference in the mode in which these substances act on animals and on vegetables: on the former they act by "sympathy" upon certain parts with which they have no immediate contact, whilst in the latter they produce their effect only on those parts of the tissue into which they are introduced. In vegetables, also, all poisons exert their action upon the cellular tissue, whilst in the more complicated structure of the animal frame different poisons will attack only particular tissues; which again seems to prove the existence of no more than one single faculty in vegetable life, as we concluded to be the case, from other considerations, in the beginning of this article. It is a curious fact in the action of vegetable poisons, that a plant may be killed by the poison which it has itself secreted, as a viper may be stung to death by its own venom. Hence it has been very generally noticed, that the soil in which any particular plant has grown, and into which it has consequently discharged the excretion of its roots, is rendered noxious to the growth of plants of the same or of allied species, though it be quite adapted to the support of other species. This fact is of the greatest importance in an economical point of view, as the whole theory of the rotation of crops may be considered to depend upon it The discovery of this important step in agriculture was probably made by the Belgians; at least they have the merit of having developed the theory of it.—Formerly it used to be said, that the whole secret of good husbandry consisted in ploughing well, and in manuring well; but to these must now be added the equally important art of so arranging the cultivation of different crops that they may mutually assist each other, and thus enable the farmer to obtain the greatest possible annual return from the same land. The whole theory depends upon the fact, that all plants succeed badly upon lands which have lately borne crops of the same species as themselves, or even of the same genus, or of the same family. This effect is not owing to any exhaustion of the soil that must have taken place during the growth of the previous crop, but arises from a corruption of the soil, by the intermixture of vegetable excretions given out at the root, which excretions are always more deleterious to plants of the same kind than to others. It is even ascertained that the excretions of some plants are beneficial to the growth of others of a different family; the *Leguminosæ*, for example, improving the soil for the *Graminæ*. Agriculturists have proposed various theories to account for the beneficial results obtained by a rotation of crops. Some have supposed that one species, by its denser foliage, chokes the weeds which otherwise would spring up, and assists the crop in exhausting the soil; others have attributed the improvement that has taken place to the remains of the previous crop, which they suppose may have acted as manure; a third have said, that the roots of different crops extend themselves to different depths, and so extract their nourishment from portions of the soil which do not interfere with each other; and lastly, it has been urged that plants of different families may possibly derive their nourishment from different materials. It may be true that some of these causes have a certain degree of influence in determining which may be the most proper plants for a rotation, but they can only be considered as of a very secondary importance when compared with that which relates to the deterioration of the soil, by its intermixture with the radical excretions of a previous crop. After enumerating some of the collateral circumstances which should direct the judgment of cultivators in selecting such plants as may be best adapted to a rotation of crops in any particular district, De Candolle proposes the following fundamental and physiological principles, which ought to be attended to where complete success is to be expected. *First*, a new crop ought never to succeed another of the same kind, unless under some very peculiar circumstances, as where the soil is annually renewed, or where it is naturally so fertile as to be capable of resisting the inconveniences which ordinarily result from such a system. *Secondly*, a new crop ought not to succeed another which has been raised from plants of the same family. A remarkable exception to this rule occurs in the practice adopted in the valley of the Garonne, where the soil admits of a biennial alternation between wheat and maize. *Thirdly*, all plants with acrid and milky juices injure the quality of the soil, and their remains should never be buried after the removal of a crop. *Fourthly*, plants with sweet and mucilaginous juices improve the soil for others of a different family. The chief of these are the *Leguminosæ*, which are commonly adopted in practice for this purpose.

GAMA GRASS.

From the Newbern Spectator.

The grass which passes under this name has acquired a considerable degree of celebrity, and promises to become of much importance to the agri-

cultural interests of the southern states. I say to the interest of the *southern states*, because the northern and western portions of our country are already so well provided with a variety of valuable grasses suited to their climate and soils that to them the acquisition of one more can be of little importance, if indeed the one we are now considering should prove to be adapted to a northern climate. Whereas, in the *alluvial* portions of the southern states, I believe that neither clover, timothy, orchard grass, herd's grass nor any other of the grasses derived from northern climates, have ever proved, or ever will prove extensively beneficial. The consequence is, that throughout this extensive and fertile portion of country *no hay of any kind is made*,* and the only native product relied upon as provender for horses and cattle generally, are the dried blades of Indian corn. (Zea mays.) Charleston and Savannah import northern hay, and even in the interior as high up as Columbia and Augusta you meet with it!

During the last summer and fall, while engaged in occasional investigations of the botany of this neighborhood, I found upon the shore of the Neuse two species of grasses belonging to the genus *Tripsacum*, to wit, the Tripsacum *dactiloides*, and the T. *monostachyon*. At that time I had not seen the "Gama grass," nor any of the publications relating to it, and therefore did not know, what I have since ascertained, that one of these species is probably the famous "Gama grass." During the last winter I saw in the possession of a gentleman in Florida a few of the seeds of the Gama grass, which he had received from abroad, and he informed me that he had found the same grass growing native in Florida. I immediately recognised them as belonging to one of the species of *Tripsacum*, apparently the T. *monostachyon;* but I was held in some doubt on account of a third species of this genus, mentioned and described by Michaux, in his North American Flora, under the title of Tripsacum *cylindricum*, and found by him *in Florida*. This species, like the T. *monostachyon* has *cylindrical spikes*, while the T. *dactyloides* has them flattened on one side, and rounded on the other, but differing from both in the circumstance of having its flowers "*hermaphrodite*." On looking into Loudon's "Encyclopedia of Plants" I found mentioned a species growing in the *West Indies* under the title of Tripsacum *hermaphroditum*, which I could scarcely doubt to be identical with the T. *cylindricum* of Michaux, having hermaphrodite flowers, a species which Elliott suspects to belong to the genus *Rotbollia*, and which Nuttall, probably from its ambiguous character, has not mentioned at all. But the Encyclopedia of Plants further remarks upon the genus Tripsacum that they are *grasses, used for provender in the West India islands*, an expression somewhat loose, as only one species of the genus is said to grow in the West Indies, but indicating the opinion of the writer that *all* the species might be employed for that purpose. And to this conclusion I have been led by my subsequent inquiries of those who have cultivated the grass. For one gentleman assures me that the grass which he cultivates as the Gama grass has the spikes *aggregated*, and is therefore the Trispacum *dactyloides;* another that the spikes of his grass are *cylindrical* and *solitary*, and is therefore the T. *monostachyon* if indeed it be not the T. *cylindricum* of Michaux. I left Florida before the grass there cultivated had evolved its spikes, and therefore could not ascertain to which of the species it belonged, though it must be to one of the *last two*. Which of the three species is the true *Simon Pure* I will not undertake to determine, but my conclusion is that all of them may be employed with almost equal benefit. Perhaps the two last species may be less rough than the first, and I apprehend that if the grass be not frequently cut, it becomes too rough, and will be refused by horses, if not by black cattle. But the great value of the grass is that it grows with great rapidity and luxuriance even in the sandy soils of the south, if moderately rich, and bears cutting, it is said, every month during the summer and fall. The published accounts say that it will yield from 75 to 90 tons the acre; and I learn from a gentlemen who cultivates it (W. B. Meares, Esq., of Wilmington,) that it does well both in sandy and clay soils. It appears that one of the species is found native in Florida and the West India islands, and the two others along the Atlantic coast from the Delaware river to South Carolina and probably to Florida, and also "in the vast prairies of the western states," as Mr. Nuttall informs us. It is therefore probable that this is one of the few valuable grasses that adapt themselves to every climate and every soil.

Those among us who wish to obtain it, have only to search for it during the ensuing fall alone our river shores. If they have once seen and observed the seeds of one of the species they will be in no danger of mistaking the plant, for it has a decided *character*.

H. B. C.

* Occasionally a little hay is made in the south from what is called the "crab grass" (Eleusine indica.) But this grass will grow only in cultivated soils.

CHINA LEAVES *vs.* WEEVELS IN WHEAT.

From the Southern Planter.

Mr. Editor,—As the prospect is bright for a heavy crop of this useful grain, and as the ravages of the weevel are so destructive, that little is produced through the winter; I conceived I might do service to the community by communicating the result of experiments made in conquering so deadly a foe to the lovers of good biscuit. I had read in some agricultural work that the leaves of the *elder* and of the *Lombardy poplar* were a preventive. I *tried* the elder,—no, I speak falsely. I put a few twigs on the top of a hogshead of wheat, and found no benefit. This is a good deal like many of my attempts, which have been pronounced trials. The fact is, I was too lazy to experiment properly and test the prescription as I ought to have done, and some of your readers may be like me. O, I had tried the elder, I said, and it was a mere notion.

In 1831 I raised, say 300 bushels wheat, and had it thrashed out early and put in a room 18 feet square, ground floor. The last of July I examined the pile and found the black weevel was thick at the bottom, and the flying ones about. The idea struck me that if the *scent* of the elder leaf was a *preventive*, that of the China leaf, as stronger, would be more likely to answer. Large parcels of the twigs were mixed with the wheat, and in one fortnight, the next time I was at my plantation, not a weevel was to be found! So it was not only a *preventive* but a *remedy*.

Last year several persons tried my prescriptio

and the same happy effects were the result—the weevel was driven out. I should have made the experiment public last year, but wished further trial to test its unquestionable certainty. The leaves or twigs should be spread on the bottom of the bin or hogshead, and the wheat poured upon them and also some should be mixed along through the heap. No unpleasant taste or smell is left behind. I will insure the whole crop of Georgia for a quarter of a cent a bushel if well mixed with the China leaf. LAZY PLANTER.

April, 1833.

VEGETABLE MOULD.

The first inroads and fertility on barrenness are made by the smaller lichens, which, as Humboldt has well observed, labor to decompose the scorified matter of volcanoes, and the smooth and naked surface of sea deserted rocks, and thus to "extend the dominion of vitality." These little plants will often obtain a footing where nothing else could be attached. So small are many that they are invisible to the naked eye, and the decay of these, when they have flourished and passed through their transient epochs of existence, is destined to form the first alluvial layer of vegetable mould: the successive generations give successive increments to that soil from which men are to reap their harvests, and cattle to derive their food: from which forests are designed to spring, and from which future navies are to be supplied.

But how is this frail dust to maintain its station on the smooth and polished rock, when vitality has ceased to exert its influence, and the structure which fixed it has decayed? This is the point which has been too generally overlooked, and which is the most wonderful provision of all; the plant, when dying, digs for itself a grave, sculptures in the solid rock a sepulchre in which its dust may rest.

For chemistry informs us that not only do these lichens consist in parts of gummy matter, which causes their particles to stick together, but that they likewise form, when living, a considerable quantity of oxalic acid, which acid, when by their decay set free, acts upon the rock, and thus is a hollow formed in which the dead matter of the lichen is deposited. Furthermore, the acid, by combining with the limestone or other material of the rock, will often produce an important ingredient to the vegetable mould; and not only this, the moisture thus conveyed into the cracks and crevices of rocks and stones, when frozen, rends them, and by continual degradation, adds more and more to the forming soil. Successive generations of those plants successively perform their duties, and at length the barren breakers, or the pumice plains of a volcano, become converted into fruitful fields.—[*Professor Burnett's Lecture.*

SALT USED AS MANURE.

From the American Farmer.

Richmond, Va. June 1, 1832.

MR. SMITH:—Having long considered salt as one of the cheapest and best manures we could apply to our lands, and having a small lot of very light sandy land, I determined to apply it in conjunction with clay and a small quantity of lime, which I concluded to add only because it was convenient to the spot to be manured. I dug from a pit two hundred bushels of good red clay, and to a layer of twenty bushels I scattered not quite a peck of ground alum salt and one bushel of oyster shell lime unslacked; going on until the whole of the clay was used. To the two hundred bushels of clay there were ten of lime and two of salt. The heap remained in that situation until late in April, when I measured an acre of land carefully, which had been ploughed the preceding winter; on this the mixture was neatly and carefully scattered; on the adjoining acre I scattered two hundred and twenty bushels of the clay, without the salt or lime; on the next I scattered ten bushels of lime; and on the fourth I sowed two bushels of ground alum salt. The land was then laid out in rows four feet each way and planted in corn which was thinned to one stalk, and all received the same cultivation. In October the corn from the first acre was gathered, and measured thirty-one bushels and one peck. On the second there were fifteen bushels and a half; about the quantity the land would have been capable of producing without the addition of lime or other manure. On the third twenty-one bushels and a half peck. And on the last, with salt alone, twenty-four bushels and a half peck, making a large difference in favor of the mixture. If the result of this experiment is worth insertion in your useful paper, it perhaps may be of use to the owners of the sandy soils in the lower part of Virginia. SANDY LAND.

[The foregoing piece is republished at the request of a subscriber in King William, who very naturally considers the facts stated as highly important, if similar results may be generally expected from the same causes. We presume that the writer has not failed to repeat an experiment so interesting and profitable, on an extended scale: and we shall be pleased to receive for publication the report of his success.]—*Ed. Farm. Reg.*

ON GYPSUM AS A MANURE.

From the Columbia Sentinel.

Last week we ventured some observations on the proper time for sowing gypsum. This week we propose to go into a consideration of the question of the *usefulness* of gypsum as a manure.—There is the more neccesity for this, from the fact that a controversy is now going on upon this subject in the Genesee Farmer—one contending for its use, another denying that it is ultimately beneficial to the soil after a few applications. If we turn to the ninth volume of the Agricultural Magazine, we will see that comparative trials were made between this and other manures, on a stoney clay, mixed with a little loam, to ascertain the best manure for wheat. "A five acre field was divided into five equal parts, exactly an acre in each. They were equally well ploughed and laid down to wheat, after being manured as follows:

On No. 1 was sown 6½ bushels of gypsum.

On No. 2 was put a compost manure, consisting of lime, rich earth, and dung.

No 3. was manured by yarding cattle on it.

On No. 4 stable dung was thinly spread.

On No. 5 lime prepared from oyster shells was sown.

The product was from

No. 1, forty bushels,

No. 2, thirty-six bushels,

No. 3, thirty-five bushels,
No. 4, thirty-three bushels,
No. 5, thirty bushels.

The seed wheat was of the best Sicily kind, and weighed 62 lbs. per bushel—the product weighed 63 lbs. per bushel."

Next follow eight different experiments of the effects of gypsum on the different grasses, excepting clover. In all cases the quantity of land was the same, and the soil as much alike as possible. The results uniformly proved that the profits were from ¼ to ½ greater than where none had been used. On clover the benefits were still more marked. The gypsumed yielded per acre a product of hay equal to 15
The ungypsumed only equal to 5
The gypsum yielded in seed per acre a product equal to 30
The ungypsumed yielded in seed, do. only 5½

The experimenter adds—"The invariable results of the several experiments, which are faithfully, and he trusts correctly stated, he thinks incontestably prove that there is a most powerful and subtle principle in this tasteless stone; but by what peculiar agency or combination it is capable of forcing vegetation in such an instantaneous and astonishing manner, time reserves for others to unfold."

From the above experiments, it is distinctly ascertained that gypsum produces its greatest effects on clover. Time and experience have confirmed this fact, and it is now generally understood that as a manure it is not so beneficial to the narrow-leaved as it is to the broad-leaved plants, such as clover and corn. Besides the above experiments, the general observation of farmers is conclusive on this point, and we could quote abundance of authority in proof of this position. I have seen one half of a field which had clover growing in it sown with plaster, and the other part remaining unsown.—The eye could distinctly trace the part sown from the part unsown. First from the increased size of the one, and next, from the sickly and yellow appearance of the other. The line of demarcation was so observable, that the cause of it was a frequent source of inquiry. But this is only one among many similar instances. My own experience and that of my neighbors fully bears me out in the opinion, likewise, that clover, to come up well and do well, must be aided by having the ground sprinkled with plaster as soon after it is sown as practicable. This is an experiment which I have frequently made, and have long since looked upon as a settled principle in farming.

Previous to the use of plaster and clover as a manure, (for they ought to go together,) what is now called the best of land in this vicinity might have been purchased for less than $3 per acre; and I have heard of several purchases being made at less than one dollar. Now this land is made to yield the interest of $100 per acre, free of expense—is constantly improving, and there are no farmers who thrive so well as those who are the most lavish in the application of these two manures. I verily believe, deprive them of the use of clover and plaster, and their farms will degenerate, if not as low as formerly, still so much as to make their cultivation very unprofitable. Plaster does not do its maximum of good without it is sown on clover; and clover will not grow luxuriantly unless it is sprinkled with plaster—they mutually aid each other, and when both are freely used, they are a mine of wealth to the farmer. It is not because he has large crops of clover for hay, but this clover being turned under by the plough, is the best possible coating of manure that his fields can have to bring him heavy crops of wheat, corn and oats; not rye—his land is too good for it—it is too cheap a produce when wheat, which is more profitable, may as easily be raised. It is principally indirectly, therefore, that gypsum is so valuable as a manure. We are perfectly willing to concede that its good effects are not so distinctly marked as formerly; the poverty of the soil made it then so peculiarly grateful to it, that it once yielded a hundred fold. Now the quality of the soil having materially improved by its frequent application, they are not, of course, so observable. It ought to be enough for us that crops are growing more and more abundant. It is the proof that something is at work, in farther fertilizing the soil.

The sowing of gypsum has produced another and great revolution in farming, and materially lessened the labors of the farmer. It is by making it unnecessary for fields to lay a season to fallow, by which not only the use of the land is lost for the season, but you save the labor of ploughing it two, and often three times, for a subsequent crop of wheat. How much simpler and more profitable the process now. One year you sow your fields with oats, barley, &c., in the spring, at the same time you put on your clover seed and plaster. The subsequent year you have a fine field of clover, enough to cover the ground completely, and affording abundance of food for your stock for grazing. You fatten them at the same time that you fatten your soil. The coming autumn the remains of the clover are turned under with a single ploughing—you sow on your wheat—apply your drag, and your work is done. The chance is, you will have a much better crop than by the old method of frequent ploughing and fallowing, even if you have added to your fallow land a thin covering of stable manure. When clover can be made to grow so thrifty as to crowd out all other plants, which is frequently the case, it is the best preparation that our soil in the present state of farming can possibly have. But it must have only one ploughing. The clover lay well turned over, must be permitted to lay there, according to modern experience, and a heavy crop of wheat or corn is almost the invariable result. A.

PRODUCTIVE FARM.

From the New England Farmer.

My farm is a stiff clayey soil, rocky, uneven, hills and valleys, particularly adapted to the growth of fruit trees, such as pears, apples, peaches and cherries, of which I have about 200 thrifty trees of the choicest varieties, most of them in a bearing state; besides mulberries, quinces, grapes, &c. It contains 160 acres, 20 of wood, the remainder mowing, tillage and pasture land, all in one body, with the great mail road from Boston to Washington running through the centre. I get my living by farming, and keep my eye steadily on the profits of my farm, which must exclude every thing like overwrought agriculture, or extravagance, from the premises.

The following items may not all be perfectly correct, but are so nearly so as to answer my de-

sign, and give a sum total varying but little from the truth. I would remark, that in consequence of sickness in my family last summer, and other causes, my dairy did not receive that attention, and was not nearly so productive as it otherwise would have been.

DAIRY.

Most of my butter was sold in Boston by Col. Maynard, and brought from 17 to 28 cents per lb. About 350 lbs., the most sold at any one time, brought 24 cts.—we will call the whole 22 cts. lb.

Butter, 3487 lbs. at 22 cents,	$767.14	
New milk cheese, 1575 lbs. at 9 cents,	141.75	
Cheese, 735 lbs. at 4½ cts.	33.07½	
Do. 1526 lbs. at 3 cts.	45.78	
Veal, and 4 calves that were raised,	151.47	
Total of Dairy,		$1139.21½

BEEF.

I fatted 9 cows, and one ox that weighed 1005 lbs. One bull six years old, which I raised on skimmed milk, and with his mate a stag, did most of the ox work on my farm for four years. He had 85 lbs. of rough tallow, and weighed 1209 lbs. The ox, bull and 9 cows, amounted to $308.36. Four oxen were sold by Col. Fay, at Brighton, to G. Adams, for 39s. cwt. The whole amount for beef was $603.44

PORK.

I fatted 19 hogs which I bought of Theodore Smith, that he drove to Columbia county, N. Y. Their average weight when I bought them was 86 lbs. I kept them through the winter on English turnips, boiled with a little, and but a little, corn and cob meal put with it. When slaughtered 14 of the best averaged a fraction over 500 lbs. each; 15 of them were carried to Boston, and sold for 7½ cents. The hogs amounted to $651.82

Total of dairy, beef and pork,	$2394.47½

The above is the produce of one year, commencing March 25, 1832, and ending March 25, 1833.

SAMUEL CHAMBERLAIN.

Westborough, 1833.

SHEEP HUSBANDRY,

We have heard it remarked by some of the best farmers of Dutchess, will insure the gradual improvement in fertility of a farm. The following extract comes in corroboration of this opinion. It is from *Reports of Select Farms*, No. IV., and has reference to a Gloucestershire hill farm:

"The improvement of the soil which he occupies ought to be the object of every farmer. Land, in a natural state, if dry, undergoes a gradual improvement from the yearly growth and decay of the vegetable substances which grow upon it.—But if the vegetable substances which grow upon it are eaten off by sheep, which drop their dung in return and in small portions at a place, the improvement goes on much more rapidly. Hence land that is always pastured by sheep, is always improving, while that which is always mown is deteriorating. The number of sheep, therefore, kept on this farm, tend much to its gradual improvement; and the regular deposition of the sheep's dung over so great a portion of the farm, every year, in consuming the turnip crop, is an excellent preparation for the course of cropping that is to follow. The double manuring which the land thus gets, in the same year, may be thought by some to be too much; but the land of this farm and the whole district is so thin and brashy, that it can hardly be overdone with manure."

DOMESTIC SILK IN VIRGINIA.

From the Lynchburg Virginian.

We are glad to perceive that several persons in this section of country are turning their attention to the culture of silk—an occupation amusing and profitable, while it is not at all laborious. Some weeks ago we saw a beautiful specimen of sewing silk, manufactured in the family of Capt. Lewis Brown, of this place; and on Tuesday morning last, a gentleman called at our office and exhibited a quantity of the same article, manufactured by the lady of Mr. Robert Mills, of Bedford county. Raising silkworms and the culture of silk is attended with so little trouble and expense, that we hope it will be generally practised by the ladies, who will find it no inconsiderable source of revenue.

LUCERNE.

From New York Statesman.

New York, Nov. 26, 1827.

DEAR SIR,—When I was at your farm last summer, I observed a field of *lucerne* in luxuriant growth, and of great promise. Your absence from home prevented my learning the particulars of its culture, uses, and value.

This grass, I think, is not grown to any considerable extent in Great Britain or Ireland. In passing through those countries a few years ago, I do not recollect to have seen it at all. Perhaps the humidity of the climate, the nature of the soil, and the strong growth of the other *finer* grasses, may account for its absence. In France, however, I found it held in great esteem; it produced abundantly, allowing of four or five cuttings in a season, and was used in its green state for *soiling* cattle.

Your experiments have, no doubt, been made with care. A detailed statement of them will be of service to our agricultural interests. If you will oblige me by furnishing the statement, it will gratify me to be the medium of communicating it to the public.

Yours, very respectfully,

I. M. ELY.

HON. JESSE BUEL, Albany.

Albany, Dec. 7th, 1827.

Dear Sir—I most cheerfully comply with your request, in communicating my experiments in the culture of lucerne.

My first essay to cultivate this grass was made in 1820. I sowed it with summer grain, but too thin; the summer was dry, and not more than a fourth of the plants survived till autumn. I ploughed it up at the end of the second year.

In 1824, I sowed sixteen pounds of seed on an acre, well prepared by manure and potatoes the preceding year, with half a bushel of winter rye, the whole broadcast. The ground was well harrowed and rolled after it was sown. The rye soon spread its leaves upon the surface, and protected the lucerne until its roots had good hold of the soil.

It grew well, notwithstanding the drought. The latter end of August, perceiving that some of the rye was pushing up seed stalks, and that some weeds were overtopping the grass, I mowed it, and fed it green to my cattle. In 1825, I cut three tolerable crops, and soiled it to my cows. In 1826, I cut it four times for green fodder, and in the autumn gave the field a slight top-dressing of rotten dung. This year my stock has consisted of six cows and four oxen. My summer pasture would not more than suffice for two of them. I fed them on ruta baga and hay till about the 20th May, when I commenced cutting, and feeding my lucerne, morning and evening, in such quantities as I found my cattle would consume. By the time I had cut over the acre, the part first mown was again fit for the scythe. Two cuttings, with the small pasture in which the cattle run, sufficed till my meadows and grain fields were fit to turn into. A third crop was cut for hay, and a fourth might have been cut also, but for the difficulty of curing it. This is the field which you saw when at my house.

From my own experience, as well as from the observations of others who have cultivated this grass, I am satisfied, that an acre of good lucerne will feed six cows five months, from the 20th or 25th May to the 25th October. This, to a person located as I am, upon a small farm, where land is high, would be worth $45, or $1.50 per month for each beast.

Lucerne is less affected by drought than any grass I am acquainted with; and but few grasses abide longer than it does in the soil. It does not attain its full strength until the third year, and its medium duration is ten or twelve years.

I will further remark, for the guidance of those who may undertake to cultivate lucerne, and are unacquainted with its character and habits, that

It requires a rich, deep, clean, light and dry soil. It will neither do well upon clays nor wet grounds.

It should be sown only in spring, when the ground has acquired warmth sufficient to promote a quick and vigorous growth.

It should be mown for soiling as soon as the blossoms appear; and be permitted to wilt a few hours in the *swath* before it is fed to neat cattle; and lastly, like all other crops,

It is benefited by an occasional dressing of manure. I think the best way is to apply compost or short dung in autumn, and harrow with a light harrow in the spring.

When cut for hay, there is a difficulty in curing lucerne without great loss, as the leaves dry and crumble before the stem is cured. It should be managed like clover—lay a few hours in swath, and then be put into small slender cocks with a fork. It will cure in two good days. I mixed my autumn crop, in the barn, with alternate layers of straw.

Respectfully, your obedient servant,

J. Buel.

Isaac M. Ely, Esq.

Calendar, (near Yonker's) Westchester County, Dec. 31st, 1827.

Dear Sir,—Your favor of the 26th instant, together with an accompanying copy of "the Statesman" you were so obliging as to send me, I received by this morning's mail.

I have attentively perused the statement of Judge Buel, in his letter to you on the subject of lucerne, and am pleased to find that his experience, in its culture, so fully accords with my own. The first experiment I made with this grass was in the summer of 1821; but the seed did not vegetate, owing, doubtless, to their being unsound, rather than to any peculiarity of management; for, when good, they appear to germinate as freely as those of red clover. Not being discouraged by my first essay, I prepared the following year, the same piece of ground for the reception of fresh seed. This was sown broadcast, in the early part of July, 1822, without a protecting cover. The plants soon made their appearance, notwithstanding a period of dry weather which succeeded, and continued to grow finely, till checked by the frost. As the crop was neither cut nor depastured, a large burden was left on the ground; and in the ensuing spring, before other grasses had yet started, the lucerne exhibited a flourishing growth. Without entering into any further details respecting this crop, it will be sufficient to say, that it completely justified, in all respects, the encomiums I had read upon its value. It may be well, however, to remark that, in accordance with the directions of some writers on the subject, I had the ground harrowed, for the alleged purpose of extirpating weeds and promoting its vigor. This was done in the third year of its growth, and by these means more than half of the roots were destroyed. The remainder, however, continued to grow well for a year after; but as the crop did not exhibit the flourishing appearance as before, I determined upon breaking up the ground.

In the beginning of May, 1823, I had about two acres sown with lucerne. The ground was divided into three pieces, and each piece was, along with the lucerne, sown with a different grain crop. These consisted of barley, buckwheat and winter rye. The result of the experiment was as follows, viz: that sown with the rye proved the best, and that with the barley ranked next in quality; but what accompanied the buckwheat was entirely smothered. The lucerne growing on the two former pieces, being now in the *fourth* year of its growth, is in a most vigorous state; and so far from evincing any symptoms of decline, continued to grow, the last season, more luxuriantly than ever. I commenced cutting it *last* spring, on the 27th of April. It then yielded, I should judge, at the rate of a ton and a half to the acre, on the supposition that the grass had been cured into hay. It was cut for the purpose of soiling, and given to horses in the stable and to working oxen. The produce amounted, during the season, to six cuttings. In this experiment, the quantity of seed used was at the rate of 20 lbs. to the acre. It was cultivated on a soil similar to that described by Judge Buel, as indispensable to its success.

It is unnecessary here to recapitulate all that has been said and written in favor of this plant. I would remark, however, that the great advantages which have been alleged in its favor, are fully borne out by my own experience. It may, further, be well to observe, that, in referring to the remarks of Judge Buel, there was no difficulty whatever in its being made into hay, when managed in the mode he describes. And it seems to me a matter of some importance to bear in mind that, although the virtues of lucerne have been most largely descanted upon by *British* writers,

it is a plant which is far better adapted to our own climate than that of Britain. The latter country it would appear, does not possess the requisite degree of heat and dryness to insure the full advantage of its real value. And it seems to be expedient, if not necessary, in that country, to cultivate it at the expense of drilling—while here it answers with perfect success in the easier and cheaper mode of *broadcast*.

Notwithstanding, however, what has been said in praise of the merits of this grass, I am not unaware of the objections that have been made to its general introduction in this country. More especially of those advanced by a distinguished agriculturist in the vicinity of Philadelphia. It was my intention to have noticed them, and to have offered some views of individual practice in relation to the subject, leading to a difference of conviction. The length, however, to which this communication has already attained, prevents me from dwelling any longer upon the merits in question.

With great respect, I am yours, &c.

VANBRUGH LIVINGSTON.

I. M. Ely, Esq.

REPORT ON THE STATE OF AGRICULTURE IN PRINCE GEORGE.

[Submitted to the Agricultural Society of that county and approved March 9th, 1821.]

From the records of the United Agricultural Societies of Virginia.

The committee appointed by the Society, to inquire into the state of agriculture in the county of Prince George, and to suggest the remedies which they may think calculated to correct the existing defects, regret to state, that the want of means for obtaining correct information will, of necessity, prevent as ample an investigation of the subject referred to them, as its importance merits.—They believe, however, that the report now submitted, though perhaps not altogether accurate, is at least free from those prejudices which would prompt either a flattering picture or hideous caricature.

The soil of this county is generally light and poor, though a considerable proportion differs in one or both of these characters. Rich land, or such as once was rich, is only to be found along the rivers and swamps which intersect the county. All the good soils have been long under cultivation, and are much exhausted, but still exhibit a marked superiority over the great body which was originally sterile. From one-third to one-half the county is arable, or cleared land, and the remainder wood-land, tide marsh, swamp, &c. very little of which is worth bringing under cultivation.*

The three-shift system (that is, corn followed by wheat, when the land is equal to the production of 4 or 5 bushels per acre, and the field then grazed until the fourth year, when its turn comes again for cultivation,) is now, and long has been the usual course. Those who pursue it, seek to prevent a diminution of their crops, by clearing the adjoining forest, and thus increase the size of their fields, or supply the place of what is utterly ruined and thrown out of cultivation. Their great object is to cultivate as much land as possible, and this so completely employs their labor as to leave very little for improvement. Under such management, it is scarcely necessary to add that our land becomes poorer every year. Though many have, to a greater or less extent, abandoned the three shift system, for a better; yet we fear there are still more, who practise even a worse mode, by denying to their fields that small share of rest which three shifts afford.

The quantity of tobacco made for the last ten or fifteen years, has been very inconsiderable; and though the effort is now general to increase its production, (on account of the low price of grain;) that crop must still be very limited. We have but little woodland to clear, rich enough to produce tobacco, and therefore nearly all must be made on our small quantity of highly manured land.—If the first effect of this change, is increased attention to making manure, it also directs its whole application to a crop, which gives nothing to the soil in return, and must ultimately make the progress of exhaustion still more rapid than before.

Gloomy, however, as is this view of the tillage of our county, we hail with pleasure the dawn of light arising from the spirit of inquiry now generally excited, and the increasing interest which is felt on the subject of agriculture. We already perceive, within a few years, manifest evidences of improvement; and we therefore, in pursuance of our instructions, proceed with greater confidence to point out those obstacles which have in an essential degree tended to obstruct its advance. If in the course of this inquiry, propotitions are advanced which appear either trite or paradoxical, we hope at least, that they will not be denounced, until investigation decides them to be useless or false.

In every age, country and situation, the best system of husbandry is *that which yields most clear profit to the cultivator, for the capital and labor employed.* The correctness of this definition will be

---

* When the swamps of this county are said to be scarcely worth bringing into cultivation, the assertion is intended to apply to the only course which now can be adopted for draining them, that is, by the unconnected efforts of different individuals, who are compelled always to begin the work at the wrong end—on the outskirts and head branches, instead of at the outlet and through the middle of the swamp. Therefore all attempts have been attended with great labor and expense, and have never had more than partial success. But if our legislature would PERMIT extensive swamps to be drained on a rational plan, the improvement would be one of the most valuable and decidedly the cheapest which could be effected in lower Virginia. Blackwater Swamp and its numerous branches contain thousands of acres of the richest land, which is likely to continue useless and a nuisance. A considerable portion belongs to this county. A central drain ten feet wide would effectually reclaim all this land, and perhaps at the same time afford good sluice navigation during part of the winter. But however well assured its owners may be of the value, and cheapness of this operation, it never can be effected by private agreement among so many persons. If only one of their number refuses to unite in the plan, or is a minor and of course unable to consent, all the rest can do nothing—A law ought to be passed to grant to those owners disposed to attempt this work, power to proceed at their own risk, and only in case of their succeeding, compel all others benefited to pay their full proportion of the expense, out of the new value given to their land. In this way no person could possibly incur loss against his will or have any reason to complain. If such a law should be considered an invasion of the rights of property, then still more so must be all laws for cutting public roads, digging canals, and indeed every other which combines the means, of all, for the benefit of all.

admitted to be so palpable, as to need no elucidation. But obvious as it is, experience proves that it has been either totally disregarded, or is at best but slightly operative. Nor do we conceive that we shall materially err, when we attribute the low state of husbandry principally to the inconceivable misapprehension of this subject, on the part of agriculturists of every description—whether practical or theoretical—improvers or exhausters of the soil.

Various and discordant as are the opinions of agriculturists, they may properly be classed under the two heads of *practical and theoretical*, which names, though not exactly appropriate, will serve for the purpose of distinction. With our practical men, he is the best farmer who cultivates the greatest number of acres, and who derives the heaviest *gross product* from the amount of labor employed. The first and generally the only questions asked to decide on the good or bad management of any individual, are, "How many laborers does he employ?"—"How many acres does he cultivate?"—"What amount of crop does he make?"—By such estimates, is the practice of most of us entirely regulated.

Yet the *gross product* is very different from the *net product*, (in which the whole profit consists,) and the former may be, and frequently is increasing, at the same time that the latter is diminishing. If farmers were in the habit of calculating the probable cost and profit of every process of cultivation and improvement, and, in consequence, would reject whatever was not more profitable than costly, a most extensive and beneficial change would be immediately produced. It may perhaps be useful to state a few examples of its effects, and practices which are found on every farm in the county.

The cost of the cultivation of corn on average land, including every attendant operation, expense and injury, cannot be rated lower than $5 per acre. the highest price of corn at this time, is $2 per barrel,* and of course 2½ barrels per acre are necessary to replace the actual cost of cultivation; and from every acre cultivated producing less than that quantity, an actual loss accrues. Let us suppose a field of 60 acres to produce 180 barrels, of which 20 acres produce 5 barrels per acre, 100 barrels at $2 $200 gross

Deduct for cultivation 20 acres at $5	100
Remainder, clear profit	$100

20 acres at three bbls. per acre, sixty bbls. at $2 per barrel	$120
Deduct for the cultivation of 20 acres at $5 per acre	100
Profit	$20
20 acres at 1 bbl.—20 bbls. at $2	$40
Cultivation of 20 acres	100
Absolute loss	$60

This shows that two thirds of the field would have yielded $120 profit, and yet from the whole it amounted to $60 only. Considerable as is the loss stated, but few farmers in the county have a greater proportion of good, or a less proportion of poor land, than in the above example. Such is the profit and loss arising from our best land. We feel no disposition to exhibit a similar statement of the worst.

Suppose the clearing an acre of woodland, and putting it in order for cultivation to cost $12, and its average product to be only 2 barrels: the regular loss attending its cultivation will be $1, besides $12 for the first improvement. Not one tract of the land now annually cleared yields sufficient net product to repay the enormous expense of the operation.

Our theoretical, or improving farmers, by a different road frequently arrive at the same end, viz: diminishing the net product, to augment the gross. They define good husbandry to consist in adopting every mode of enriching the soil, and of making the different processes of cultivation as perfect as possible, so as to make each acre produce to the utmost. The rule is derived from the publications and practice of Europe, and applied to American agriculture, without considering the great difference of circumstances. In England, land and produce are high, and labor cheap: it is therefore profitable to raise as much as possible from each acre, without much regarding the additional labor. In this country, land and produce are cheap, and labor dear; and it is therefore generally to our interest to make the most of our labor, and to estimate the quantity of land as of secondary importance: Even if the climate and products of the two countries were the same, the best Virginia management if practised in Britain, would quickly lead to ruin; and if the Lothian fallow, (the perfection of Scottish husbandry,) was adopted here, the whole crop of wheat added to the fee simple of the land on which it grew, would not pay the cost of preparation. This neglect of drawing a line of distinction between improvements suitable to our situation, and such as are not, is a fruitful source of error to young and enterprising farmers. They are certain to bring upon themselves serious losses, and by giving practical men an opportunity to triumph over *book-farmers*, their own bad habits are confirmed, and new obstacles opposed to the progress of improvement. Those who in the end become the best farmers, have almost invariably passed through a long apprenticeship of loss and disappointment.

To derive as much net profit as possible from our capitals, it is necessary to discontinue much of the labor now devoted to both cultivation and improvement; but the application of the same rule will show, that many improvements which are ge-

* The price of corn has greatly increased since this report was made. The low price above stated caused a diminution of grain culture, and an increase of that of tobacco and cotton in this county, and as far as the same reasons operated, wherever climate and situation did not forbid the change. This, together with two successive bad seasons for corn, has nearly doubled its price. This temporary advance is however balanced by the depression of the price of tobacco and cotton, so as to leave our average profit for all our crops not very different from that of 1820. But whatever change may occur in price, it will not at all affect the principle on which these calculations are founded. All that is coutended for is, that the amount of *net product* is the measure and the proof of good husbandry; and from this proposition it follows, that a course of cultivation or improvement may be at one time good, and at another bad, according to the variation in the price of the product.

nerally thought too dear, would be highly profitable. The least expense should be rejected, which did not promise profit adequate to its reimbursement; but permanent improvement cannot be purchased too dearly, provided the increased profit would more than pay the interest of the expenditure. A farm which would yield a regular annual profit of 600 dollars, after paying all the expense of cultivation, would be thought cheap at 10,000 dollars. But certainly it would be equally profitable to lay out 10,000 dollars on the improvement of land, already in possession, if from that improvement, an aditional clear profit of 600 dollars, could be derived; nor would the propriety of the measure be affected, whether the quantity of land thus improved, was 1000 acres, or only ten. This, however, applies only to permanent improvement, as clearing, draining, and the application of earthy manures which change the constitution of soils.—Improvements which are temporary in their effects, such as more perfect tillage, or animal and vegetable manures, to be profitable, must return the principal, as well as the interest of the expenditure.

The want of capital is considered an almost insuperable obstacle to the improvement of agriculture. None are now so listless, or so bigotted as to consider it unnecessary, but their wishes avail nothing because, "they have no surplus capital, and their labor is already fully employed." It is true, indeed, that the capital of agriculture is small, and its profits almost nothing; but we shall, notwithstanding, endeavor to show, that we have the means for improvement fully within our reach, and without the slightest diminution of our clear annual profits. Capital cannot be increased at will, although it is not long since the belief prevailed that banking could effect that impossibility. That opinion, however, is no longer supported, and even our legislatures have become almost convinced of their mistake. If our capital cannot be made equal to our cultivation, at least our cultivation may be reduced, till the proper proportion is restored. This reduction is required even by views of annual profit, and in the portion now unprofitably directed, abundant means for improvement will be found. The full amount of labor, time and fertility thus thrown away, every one must estimate for himself; but many processes are so general, that we cannot err greatly in stating them. It would be both unnecessary and presuming in us to prescribe the precise means of improvement which shall be adopted; these must vary in different situations, and our remarks are grounded on the supposition, that every farmer knows *some* means by which he might improve with profit, could he spare time and labor for the purpose.

The labor of a plantation is devoted about twenty days in the year to repairing fences. As those on the dividing lines of adjoining proprietors, are made at their joint expense, the fences between the several fields, require at least one half of this time. By the discontinuance of division fences, we should save ten days' labor of every year, and by so doing, protect all our fields from grazing, and thus allow the land to improve itself during the whole time of its rest. We expect no wonderful effects from merely enclosing, and none perhaps would be perceived for several years. But its benefits cannot on that account be questioned. Enclosing furnishes more vegetable matter to the earth, than could possibly be done in any other way, (on our poor soil,) without any expense being incurred, and with the actual saving of ten days' labor. It is true, that we lose the means of keeping large stocks of poor cattle and sheep; but before we can admit this to be a loss of *profit*, it must be proved that some profit is derived from keeping stock in the usual mode. We are attempting to show in what manner our business may be rendered the most profitable, and not by what means we may command most luxuries and conveniences; but even on this ground, a reduction of our stock to one third their present number, would enable us to derive from them as much gross product of wool, meat and butter, and far more clear profit than now.

About 45 days of the year, the whole of our labor is employed in clearing land, of which a very small proportion is rich enough to yield any clear profit. Allowing 15 days for clearing enough for firewood and other uses, there remain 30 which may be saved without diminishing the net product of the farm.

Much land is planted in corn, which does not produce more than one barrel per acre, and about one half the arable land of the county falls short of 2½ bbls. which has been stated as the least product that will defray the expense of cultivation. One half of our land is cultivated, not only without profit, but with certain and increasing loss; and to this purpose, our labor is devoted ninety days, the whole crop being supposed to require six months. Every consideration of profit demands that this portion of our soil should not be cultivated while in its present condition. This will save of our whole labor now unprofitably employed $10+30+90=130$ days in every year, without diminishing, in the smallest degree, the farmer's net profits. Every operation discontinued was a certain source of loss, nor is there any new employment for the labor on our farms, excepting their improvement. If then the smallest clear profit can be derived from the improvement of our soil, the change of more than four months of loss, to more than four months of gain, cannot fail to be greatly and immediately beneficial.

Your committee are aware that many trivial and some real objections, (in certain situations,) may be raised against the reduction of our cultivation to the extent recommended. We have already trespassed too much on your time, to show in detail, in how few cases such objections are solid. Whatever may be the case under particular circumstances, the general question of expediency must turn on such statements as the preceding. If we have made an incorrect report of our situation, or if our estimates are false, let their fallacy be exposed—but if they are correct, or even approach correctness, it is scarcely possible for us to know our situation, and yet not receive benefit from such examinations of our own affairs. A complete change of system on a farm cannot be effected at once; but no man can be fully sensible that he is regularly throwing away one third, or even one sixth of his labor and income, without quickly attempting to remove the defect.

The obstacles to improvement, which have been mentioned, serious as they are, may be removed by our own exertions. There are others, of no less magnitude, which are beyond our control—evils which have been imposed on the agricultural interest by government, which can only be reme-

died by the same power. Required as we are to point out the causes of the depressed state of agriculture, it would be improper to pass unnoticed the violations of its rights and interests; but our limits compel us to touch but slightly on subjects, the fatal consequences of which it would require volumes fully to expose. The most injurious of such violations of our rights are the immense indirect taxes levied on agriculture, for the exclusive benefit of the *paper stock*, commercial and manufacturing interests. Against the existing privileges and monstrous pretensions of the last, our societies have already made a determined, and we hope not an ineffectual opposition. May such exertions continue until the great agricultural interest is fully awakened to a sense of its wrongs, which alone is necessary for their removal. The destruction of every fragment of exclusive privilege is demanded, not more by the interest of agriculture and the principles of sound political economy, than by the sacred rights of property, which alone can offer security for freedom.

The commercial interest, (even on the grounds assumed by the advocates of monopoly,) needs no legal privileges, to be prosperous, rich and great. Its natural advantages have made their privileges conferred by government, rather nominal than real, and the few cases in which they have effect, serve to oppress agriculture and outrage justice, without converting even a tithe of the injury to the benefit of commerce.

All these oppressions, however, are trivial when compared to the legal privileges conferred on banking. Their defenders are now silent—nothing is now heard of the once boasted blessings which our country was to receive from banks. But though convinced of their evil effects and worse tendencies, we refrain from their destruction, spellbound by the stale doctrine that charters are inviolable—that the people once despoiled of a right, are not justified in resuming it. We console ourselves, too, under this submission, with the belief that with the profits of banking, the whole system must sink, and that its present state shows its end to be not far distant. This expectation is vain; when robbers are numerous their dividend of booty must necessarily be small. The present temporary depression of the paper interest offers the strongest proof of its alarming strength; in this season of its greatest weakness—notwithstanding a loss of both property and character without parallel—although universally execrated,—yet it is enabled to retain unimpaired its exclusive privileges, and to pay as little regard to the opinion of the people as it has ever done to patriotism, probity or honor.

It is possible for us to convert our wilderness into a garden, to increase tenfold the products of our field—but if the system of monopolies and exclusive privileges be not overthrown, the increase of toil alone will be our share, while the profits must go to augment the wealth and power of chartered corporations and privileged orders.

CULTURE OF RICE ON THE EMBANKED MARSHES IN GEORGIA.

Extract from an account of an Agricultural Excursion by the Editor of the Southern Agriculturist.

The mode of cultivating rice in this neighborhood will be best understood by giving the practice of one or two of the planters. We will here give that of Col. Green, who cultivates an island immediately opposite to Darien, from which it is separated by one of the branches of the Alatamaha river. These notes were furnished us by Col. Green, merely for reference, but as we cannot improve the account which he has himself given, we prefer making use of them as they are, rather than by altering, lose any part.

"The island on which I plant is known as '*General's Island*,' and contains about eight hundred acres of tide land. I have now under cultivation about two hundred and twenty acres. My negroes are settled on the main, from an impression that a low damp situation was not as congenial to health as a higher and drier site; and where better water could be procured for use, and, also, that there would be nothing risked by gales which do at times not only sweep off entire crops, but a large portion of the negroes. There is some risk to be run in daily crossing the river, and occasionally much exposure to rain; but of the two hazards, I prefer the latter.

"I prepare my land by having large and tight banks and tight trunks, and as soon as possible thoroughly drain, putting my drains parallel with each other, at fifty feet apart, from fourteen to eighteen inches wide, and not less than three feet deep. The inequality of the surface is generally so great that a drain shallower than that will not dry the lower spots sufficiently. I think it important also that the ditches and drains should be perfectly straight, and all stumps and roots perfectly removed so as to present no point on which floating trash may hang, otherwise barriers will soon be formed. When my fields are dried for harvesting, they are generally kept dry until again planted; the stubble will die with less cold, and more effectually when kept dry, than if suffered to be kept wet or even damp. As soon as the stubble will burn, fire is applied to it, and burnt as perfectly as possible; the earlier it is burnt the more numerous the birds are likely to collect on the fields, and in many instances the ducks also; and pick up what scattered rice may then be left on the surface, as it is perfectly exposed. I think it best to prohibit the pasturage of the fields to all horned cattle and horses. Rice-field butter is certainly very fine, but it is purchased at an extravagant price. The plough is introduced when the roots are sufficiently decayed to admit its use, (the Freeborn or Dagon plough I find best,) and the land is as perfectly turned as possible three or four inches deep; by which process, the rice which has escaped the birds is so late in getting up that it rarely ever overtakes the crop, and your crop invariably comes up free from grass. Some short time previous to planting, a heavy harrow with good iron teeth is passed over the ploughed land once or twice, until it is reduced sufficiently fine for trenching. I frequently use the trenching plough, but prefer the hoe, as it is neater in its execution; but the plough despatches work rapidly where you open three rows at once. I prefer my trenches shallow and not exceeding five inches wide, and about fourteen inches from centre to centre. In land thus prepared two bushels of seed are quite enough to the acre; in land not broken up by the hoe or plough, or on new land that is rough, it requires to be planted thicker, say two and a half to three bushels per acre. I then flow from three to seven days, at first as deep as I can, to float the trash which should be taken off

as quick and as clean as possible, the water then is reduced down so as to protect the higher spots of the field from the birds. The field is dried as soon as the rice is perceived to have sprouted pretty well, which never exceeds seven days, unless the weather proves very cold, but in no case ought it to be kept flowed deep, long. I have seen whole fields of rice entirely rotted by deep flowing. This flow serves the double purpose of cleaning the field of small roots that may have been ploughed up, or particles of stubble or grass that have escaped the fire, and destroying insects that prove sometimes very destructive to a young crop. I disapprove of the point-flow, except under peculiar circumstances; if the birds are very troublesome and the land very level, the rice may be protected a few days from the birds, in the point. If the land should be unlevel, I think that more is sacrificed by this flow than would be lost by the birds. On the poor black soil that is frequently found on the main, adjoining the highlands, and which is invariably level, and from its peculiar soil is very difficult to dry when once saturated, I would always advise the point-flow and to be continued on from twenty-five to thirty days, the rice by that time attains considerable size, and most generally the field is perfectly clear of grass. The rice on this quality of land is less likely to become diseased by fox, rust, or spot, under this mode of treatment, than giving, what is termed, the long-flow, at the usual time. It will then require to be kept dry and hoed until it has formed the ear.

"But to return, as soon as I am done planting and the rice is up, I commence hoeing—at that period the work is light—the rice is so small that it must necessarily be hoed shallow, and there is no grass, and generally but few weeds to pick out of it, at that early season. Every tolerably good hand is able to hoe a half acre with ease. I prefer to hoe twice before I flow, if I have time. This depends also much on tides, as lands that are not old and much worn cannot be flowed generally but on spring tides. This is known as the long-flow, and the use of it requires as much or more discretion in the planter than any other point in the cultivation of the crop. When the water may be changed in eight or ten days, and the atmosphere is moist and calm, it will flourish for thirty days; but if on the other hand, the weather should be dry and cool, and the tides too low to allow a change of water on the fields, I have seen the plant show indications of disease in ten days. I would recommend under such circumstances, to dry the field and hoe deep and thoroughly as soon as the land is sufficiently dry. The object is to keep the plant in as healthy and growing condition as possible. Hence it becomes necessary to change the process of culture with it—if disease appears while it is dry, flow, or if when flowed, dry.

"As a general rule, the long-flow is kept on from fifteen to twenty days. I prefer flowing shallow unless the field had not been properly cleared of trash in the previous flow, or it should have become much infested with weeds previous to hoeing: in such case the water should be put on deep, to float the trash or weeds: but under no circumstances ought it to be suffered to remain under this deep flow beyond three or four days. Whilst the rice is under this flow, it is advisable to have the higher spots in the field hoed and picked clean of grass. The first hoeing after this flow should be given as soon as the land is sufficiently dry, which, if properly drained, will not require more than a week, and be hoed deep, not less than two or three inches, and the surface well broken—care should now be taken that all the grass be perfectly removed. One-third of an acre is a pretty fair average for a hand per day to hoe at this time. If time admits, the crop should all be hoed over again, but hoed shallow, and what grass escaped at the previous working must now be removed; this is termed the *lay-by hoeing*, and is light labor—a half to three-quarters of an acre per hand per day. The crop is now supposed to be made, and requires nothing more but to be flowed and the water changed as convenient. The interval, between the two last flowings is generally about six weeks, and by the time the rice has received this last flow, it has formed two, and if well grown, three joints. This flow should not be deeper than the long flow, until the rice ears out, it is then advisable to flow deep to support the plant and keep it from lodging or falling. Seven acres of rice may be cultivated to the hand, if on a good pitch of tide, when once properly ditched with the assistance of ploughs and harrows to aid in preparing it for planting, or five acres of rice and two acres of provisions, and unless the proportion of potatoes should be very small, I would prefer the seven acres of rice as the lighter labor.

"The crop of rice, as an average crop for the entire rice-growing country, is greater than in South Carolina per acre, from the comparatively large amount of new land, and the system of alternating the fields, but the amount planted per hand is small compared with the usual amount planted in South Carolina, it does not exceed four acres, and in many instances, is much below it. The mode of planting and culture also differs widely from that pursued in South Carolina, the rows are wide apart, say eighteen inches from centre to centre, and I believe never exceeding one and a half bushels of rice, planted to the acre, and I believe five pecks per acre is about the medium. Very little water is used in cultivating the crop previous to its jointing, and never, as far as I am aware of, used as an agent to destroy the grass; this renders it necessary to hoe oftener, and adds to the labor of keeping the crop clean; and I believe deteriorates the quality of the rice. I would estimate the average rice-crop of this neighborhood at fifty bushels per acre. I am perfectly aware that many persons will doubt this as being too low an estimate; be it so, I will then, to convey my idea, say it is twenty per cent. greater than is made usually as an average crop on Sam Pit, Black river, Peedee, or Waccamaw. I know the proneness in planters and overseers to over estimate the real amount of their crops. I do not think that more than forty bushels per acre are made on an average on those rivers. Here and there a solitary planter makes sixty bushels per acre, or occasionally a solitary field may make it; but that would not be a fair estimate of the average crop of the district for a succession of years."

* * * * *

Although there are many islands in this river, and the borders are swampy, yet there is, compa-

ratively, but a small portion, which is well adapted to the culture of rice. The right pitch of tide does not extend more than three miles, commencing at "*Hopeton*," and terminating with "*Champney's Islands*," above the former the crops would be extremely uncertain from the liability to injury from freshets, and below "*Champney's Island*," the salt-water would occasionally prove an unwelcome visiter. But even the whole of the space between these two points is not occupied, and there is much fine land yet to be brought under culture. The river here is very wide and divided into several large branches. Most of the islands are still in a state of nature, thickly wooded, and apparently of great fertility; but they are all more or less liable to be overflowed by freshets, for although the river has numerous large branches and several outlets, yet owing to its great length, and the tributary streams which flow into it; freshets are not uncommon, and are sometimes very destructive.

A peculiarity we noticed here, and which is common in this state, is to regulate all the operations of the rice crop by the spring tides. All of their work is done in reference to these, whether it be planting or hoeing, for it is only at these periods that they can flow their fields; consequently, if they are not prepared, they must wait for the next. They, therefore, endeavor to have certain portions of their work completed by that time—certain fields planted, certain fields hoed, &c. There is not, (owing to this cause) all the precision which is to be found on the Carolina plantations, nor can science be as effectually brought to aid the planter, for whilst with the Carolina planter, each operation is governed by the particular state of the crop, and water is put on or run off as may be required, the crop hoed, and kept dry, or flowed as may be thought most conducive to its health, the Georgia planter is obliged to wait certain periodical flowings of the tides, which must operate against him in some degree, although he can regulate his work to meet them in most cases, as these intervals are short. The average product of rice per acre on this river is greater than in Carolina, owing to the causes stated by Col. Green. We heard of several instances of four barrels being made to the acre.

REMARKS ON PUTTING DOWN TRUNKS IN RIVER BANKS.

From the Southern Agriculturist.

In continuation of my observations on the best mode of reclaiming marsh or rush land, &c. I propose to make a few remarks on river trunks, and shall go somewhat into detail, as it is a subject of the utmost importance, and one which, I think, is not sufficiently attended to. Of the building of these trunks, I shall say nothing; each of us has a preference as to the mode in which the uprights, ears, and braces should be placed, and this preference I would not disturb: all I contend for as vitally important is, that the door should fit as close as two pieces of wood can be brought together, and that the trunk should have sufficient length, say 30 feet, to keep the water both in its ingress and egress far from the bottom or foundation of the bank. In fixing upon the site of the trunk, it is usual to find the lowest spot in the field selected, under the entire conviction, that where the natural outlet of the water is, there must necessarily be the best spot for giving it vent. In theory, this is right, but if our experience is of any value (and it has been dearly purchased,) in practice, it is wrong. If you have a creek in the field, (which most commonly happens) it will be the natural outlet, yet it will not be the proper place to put the trunk; no man of observation will commit this mistake more than once. The objection to these low spots as beds of trunks are numerous; they are soft, sloughy and uneven; they want firmness and consistency, are very liable to cave in, while the work of preparation is going on, seldom retain the trunk in the position you place it, and for ever remain weak points in the bank, more liable to accidents and casualties than other portions of it. A firm, dry spot is to be preferred, even if it is a little higher than the rest of the field, for the spade can remedy this objection, and all the evils noticed above be avoided.

Having decided upon the spot, a semi-circular bank or half moon, as we term it, is to be made around it either on the inside or outside, (I prefer the latter for many reasons,) large enough to resist the tide, and at a sufficient distance from the bank to enable you to work. Some planters do not esteem this precaution essential, and for this very reason I am more anxious to impress the necessity of using it upon those who are commencing their career as river planters. It is not unusual to hear gentlemen talk of cutting the bank and slipping in the trunk in a tide, of the facility with which it is done, and of the uselessness, and even inconvenience, of a half moon. All this is easily said, and is, I believe, *sometimes* done, but I have never seen it *well done*. Indeed, when we call to mind the size and width of the bank, the depth we have to cut, the probability of its caving, the necessity of levelling the bed with great care, the sinking of the studs and erecting the breast-work, the unwieldy heavy trunk which is to be floated to its place and buried, and that all this is to be done during the gradual fall of the tide and must be finished before it rises again, it would seem worse than folly to attempt it. In addition to all this I will add, that if a large log or root is found in the bed, and nothing is more common, then it is impossible to finish your work in the tide; the bank has to be closed up, your work is all to be gone over again, and a half moon must at last be resorted to. I have seen so much trouble the result of "slipping in" river trunks, that nothing would induce me to do it; the chances are always against a successful termination of your labors, and it is a matter of too much importance to be done hastily or indifferently. If your bank is a large one (and the base always should be large) your trunk should not be less than thirty feet long, and the width about three feet in the clear; the uprights, ears and cross pieces should, if possible, be made of cedar out of the swamp, as this wood seldom rots from exposure to air and water; the studs, four in number, should be eighteen feet long, and square eight inches, if squared at all, though I leave them round with the bark on. The caps, two in number, should be twenty long, and square ten inches; these last (caps and studs) should be procured of pond cypress, if it is to be had. The piles, forty-two in number, are of pine, (or in fact any kind of wood you can obtain most easily,) seven feet long and about the size of a man's leg. These arrangements being made and these materials all collected, we are ready to put down the trunk.

The first step in the process is to sink the studs as far into the ground as either weight or the maul will drive them, before either the bank or margin is touched or cut. This is not the usual plan, but it is by far the best mode of doing it, as we have firm ground on which to stand, instead of the insecure foot-hold which is commonly presented to those whose business it is to raise and sink the studs. Between the studs a sufficient space is left to enable the trunk to float in; the caps are now put on, and we are ready to cut the bank. A clear day and neap-tides offering, we cut both bank and margin to the depth of five and a half feet, and continue this to the river on one side, and the river ditch on the other. Water will spring and we are to keep the work dry either by a pump (which I prefer) or pails. Having reached the depth contemplated, a little water is let in, or thrown in, for the purpose of obtaining a *true water level;* and all the inequalities now showing themselves are to be removed, and a smooth, clean surface presented. Three rows of piles (seven in each row) about four inches apart, are driven down three feet from each extremity of the trunk, and the heads of them, if they remain above the bed, are to be cut off, so as not to interrupt the level. If your half moon is outside, the tide will not interfere with the work, and we proceed to roll the trunk, (for it should be built upon logs that will roll) immediately over the spot it is to occupy. Water is now to be let in through the temporary trunk sufficient to fill the ditches, and enable us to saw away the rollers and drop the trunk into the water and stake it exactly where it is to be buried. Things should be left in this state until the next ebb, and when the trunk grounds, the carpenter with his square, by standing on it, can so arrange it that a perfect level will be obtained. This is the mode I always adopt, and though it may seem difficult in the detail, yet in practice nothing is more simple. But if the half moon is inside, and the flood-tide has commenced, the trunk must be floated into its bed from the river, and there left until the ebb-tide leaves it aground, and enables us to examine its position; for it is always wrong to attempt banking a trunk when it is afloat, as it seldom either assumes or retains the position you wish to give it. The breastwork which is to keep the earth from falling off, is now to be laid down, reaching from one stud to another, and supported by them. The first of these pieces is short, about ten feet, and lays on the trunk itself, the next is longer, and so on, going up until you have reached a point, a little higher than the base of your bank, when the breastwork is to be fifteen feet long. The earth is now to be thrown upon the trunk, and care is to be taken that it is spread equally over the whole surface between the inside and outside breastwork, in order that no excess of weight on either end of the trunk should cause it to settle and lose its level. These circumstances, however trivial they may appear, are matters of much moment, for it is impossible that any trunk can remain tight after its level is lost, however great the attention and care which may have been devoted to the building of it. Earth should be thrown over the trunk, so as to raise it much higher than the adjoining portions of the bank, as it will settle more than one unaccustomed to see it can imagine. The half moon ought to remain for several days around the trunk, in order that the new and fresh earth which has been thrown upon it, may unite with the old bank and become firm before it has to bear and resist the force of the tide. When you are satisfied that the union has taken place, then cut the half moon away; and by throwing the earth composing it on the bank, you are enabled to raise it to a height that defies the highest tide.

I have now, Mr. Editor, concluded all I had to say on the subject of putting down river trunks, and though, to the experienced planter, I may have appeared too minute, yet it is to be kept in mind that my observations are intended for persons in their noviciate, and that it was necessary to inform them of the detail even at the risk of being tedious. Trusting that if I have committed any errors, (and no doubt I have) either in banking the land or putting down the trunk, I shall be corrected by some of your intelligent correspondents, I will only add, that all which I have stated is the result of my own personal experience and observation, and has been found to meet all of the objects proposed to be accomplished.

I remain, dear sir, you obedient servant,

Q. E. D.

OBSERVATION ON THE INTERCHANGE OF OPINIONS AMONG PLANTERS—GAMA GRASS AND HEDGES.

From the Southern Agriculturist.

Columbia, (S. C.) June 29, 1833.

Dear Sir,—If the following desultory observations are likely to do any good, if admitted into your interesting agricultural periodical, you are at liberty to insert them. The present dearth of matter may cause them to be tolerated, and at any rate, they will help to fill up a page or two when your stock of original matter is exhausted. But, why should you ever suffer from a scarcity of materials for your journal, in a country where all are more or less interested in the success of agriculture, and where the planters and farmers form so intelligent and numerous a portion of the population? This would certainly be incredible were not the fact of its existence too true and too evident to be doubted. A class of intelligent and generally well educated men, can find no difficulty in expressing in writing their views and experience on the inexhaustible subject of agriculture, with which are connected more or less closely an innumerable variety of subjects in which the whole community, but particularly themselves, are vitally interested.

The object of Agricultural Societies is to afford their members opportunities of meeting together, and discussing all those matters which concern essentially their success and the welfare of the whole. That of agricultural publications, journals, &c. must necessarily be that of diffusing more extensively the particulars of their experience, practices and improvements; thereby furnishing a mass of knowledge by which the whole community is necessarily benefited, and they themselves (the planters and farmers) more directly and particularly so. Their daily avocation, and the distance at which they live from one another, makes it impracticable for them to meet and discuss their interest as frequently as would be desirable and beneficial; but an interchange of their views, through the medium of a public journal, is certainly the next best, if not the very best mode of communicating with each other, and, indeed, under their circumstan-

ces, it is the only practical mode in which it can be done to any advantage; for private correspondence is too circumscribed to have any but a very partial effect. Although it is very desirable to have very well written essays on the various branches of the science and art of agriculture, the less labored, either in style or matter, the plain statements of matters of fact or of speculation, that may be supposed to take place when two neighbors meet and discourse on their business, is probably likely to do as much, if not more, than highly polished and learned discussions of the highly gifted scientific men. A plain colloquial style is intelligible to all, and is in ordinary cases perfectly sufficient to communicate to the agricultural public, the improvement, discoveries or beneficial practices in which they all feel an interest. If a farmer, for example, has made the discovery of a new plant which promises advantages, the plain statement of the fact, written just in such a way as he would relate it to one of his neighbors, is probably the best and most extensively beneficial mode of doing it. Take the following instance: Mr. William Ellison of Fairfield district, discovered some time since, that a grass much celebrated in Mexico and other places, for its productiveness and its nutritive qualities, together with the facility with which it can be cultivated, grew spontaneously on his plantation and its vicinity. He communicated the fact to the public through the *Southern Agriculturist*, distributed some of the seeds among his acquaintances, and though it is now only a little more than one year since he imparted his discovery, several persons have already become so fully satisfied of the great benefit that will result from the culture of this grass, that they are now making arrangements to procure seed of it that they may cultivate it extensively. This grass, called commonly "Gama grass," (in botany *Tripsacum monostachyon)* is likely soon to wash away the foul blot on our industry which has hitherto made it necessary that we should procure hay from the north to feed our horses! May not this also help us in our exertions to raise in our own state our butter and cheese, our beef and pork, as also horses and mules, if not for exportation, at least to prevent thereafter the importations of these expensive articles. Our soil and climate are perfectly adequate to the abundant production of all these indispensable articles, it is only required that we set our minds to the task, and *persevere in it.*

I heard, last spring, that the canes, after having seeded last fall, had died and left many of the rice-field's banks quite unprotected. They will in due time come up again; but it seems to me, that no plant is better calculated to protect the rice-field banks than the Gama grass. This suggestion ought to cause some experiments to be made, the result of which is most likely to terminate in incalculable advantages. The roots of this grass are very large and deep in the ground, and if three rows of it were planted on a large bank, one on the top, and one on each side, it would form such a solid mass that no freshets could affect it. The banks would also thereby be most beneficially occupied, and the folder made from them be more than sufficient for all the wants of the planter, be they never so numerous. It would certainly be most gratifying to see the plantation-boats bring to the Charleston market, a full supply of blades and Gama grass fodder, instead of those of northern hay. That this grass makes excellent hay or fodder, I can amply testify from a small experiment which I am making, and which has induced me to plant it as extensively as I possibly can. My experiment is in high and very sandy land, and it is now six or seven feet high. A part of it I have cut twice, and is ready for a third cutting this season. It grows also, as I am informed, still better on moist land.

Here then, Mr. Editor, is a perennial grass producing the most abundant crops of any grass ever heard of, suited to every soil and situation. Can any thing be more accommodating. It grows admirably in swampy land, and in dry soils, it stands draught better than any plant I ever saw, and grows so rapidly as to admit of being cut five or six times every season. It seems to me, sir, that it only depends upon us to render our country a land of abundance, replete with the greatest plenty of the good things of this world, together with peace and contentment. It only requires a little attention and industry to set that state of prosperity a growing; for it will grow with our exertions, though these need be only moderate.

I was much pleased, sir, to see in one of your late numbers, the suggestions of Dr. Joseph Johnson, relative to the enclosing of our fields with hedges, instead of the detestable and expensive worm-fence in general use in this country. We have, most undoubtedly, many native shrubs suitable to this purpose, besides, several exotic ones that are as thrifty here as they can possibly be any where in the world. Of these, I know none superior to the "*Mespilus Pyracantha*," ("*Burning-bush*," "*Evergreen-thorn*") &c. It has the great advantage of being always full at the bottom, at least my experience of twenty years satisfies me of this, that it never becomes naked at bottom, as most other large shrubs and trees; also its being an evergreen, is an advantage, its thorns are strong, long, and sharp, and it is, withal, of a rapid growth. Its lower branches being horizontal, take root very readily by being covered with a little earth in the spring. This circumstance renders it unnecessary to plant it for a hedge closer than between two and three feet apart. Besides this, when one has a few rods of such a hedge, he may rapidly increase it by making layers of part of the lower horizontal branches, by putting a little earth on them in the spring, and the next winter they will have fine roots and may be transplanted to form another hedge, at least as long as that from which it is taken; thus in a few years, an extensive plantation may be entirely fenced with a beautiful, durable, and effective live-fence. I am, dear sir, your obedient servant, N. HERBEMONT.

ON DEEP PLOUGHING—OYSTER-SHELL LIME. THE MANAGEMENT AND APPLICATION OF VEGETABLE AND ANIMAL MANURES.

By John Hare Powell, esq.—Powelton.

From the Proceedings of the Pennsylvania Agricultural Society.

I have reclaimed, by oyster shell lime and deep ploughing, a farm, made sterile by a series of the most exhausting crops, which the cupidity or folly of bad tenants could suggest. I am not ignorant of the objections which have been often brought, and not less ingeniously supported, against breaking the "pan," and reversing the sub-soil; but I

have seen few instances, where *ultimate* success has not attended deep ploughing, in *a judicious course* of management, except on arid sands. I have turned up subsoils, of different hues, mixed with substances, varying from tenacious clay, to loose gravel, or sparkling sand, and have found, that those who condemned my "burying fertile mould beneath sterile clay," confess, that at the end of five years, I obtain great crops. by means of deep and fine tilth, from a chestnut ridge, and gravel bottom, originally covered with *barren oak* and cedar trees. Some of my friends, who are in the habit of hauling manure to the distance of 12 miles, may imagine that my proximity to the town, affords a remedy for all the defects of soil. Within 12 years, I have expended but six hundred dollars in the purchase of manure, although during part of the time, large quantities of hay were sold from my farm. Where the mould was five inches deep, I ploughed ten in the autumn—applied caustic oyster shell lime, in quantities, equal to eighty or a hundred bushels per acre. In the spring, I ploughed six, reversed the sub-soil, and took a white crop. In the next autumn, I ploughed nearly eight for a winter crop—in the succeeding year, the original depth of ten inches was reached by the plough. In some instances, for root crops, has been gradually increased. This day, with Wood's plough, No. 2, drawn by four oxen, my land has been ploughed for mangel wurtzel more than fourteen inches deep. The "caput mortuum," or sub-soil, after having in the first instance been corrected by the causticity of lime, and the expansion of frost—improved by the atmosphere, and the calcareous matter which remained, was turned below the depth of an ordinary furrow. The first crop was certainly better than that which had preceded it, as the advantages derived from the lime, the larger supply of moisture, secured by the greater capacity of the loose soil for its deposite, and the increased depth of tilth, more than compensated for the injury, that might be apprehended, from the admixture of small portions of "sour soil." The next crop was nearly as good—the succeeding crops have gradually increased in quantity, weight and value. The ingenious inventor of the substratum plough, has added much to our means of improvement, in this, as he has done by the application of his skill to the production of various implements, valuable by their simplicity and cheapness—but whilst I acknowledge the benefit he has conferred, by placing a substitute for deep ploughing within the reach of those, who cannot be tempted to reverse the subsoil, I cannot avoid thinking, that if the subsoil in all cases be deleterious to vegetation when brought to the surface—when meliorated by the chemical action of lime—by the expansion of frost—by exposure to the influences of heat and light—by the operation of various agents and manures, employed for the mechanical separation of its particles, or the supply of its deficiences, it must, in most cases be injurious to the tender radicles, which have been led to a "caput mortuum;" whither they never could have been seduced, but by the attractions of water, to vegetate, for a time—soon after to die, and disease or debilitate the plant.

I have never had apprehension of the loss of animal manure by sinking, as its component parts are generally so insoluble in water, as to cause them to be left by filtration sufficiently near to the surface for all our purposes: But I have had many motives to guard against its escape by evaporation, and therefore invariably deposite it deeply, and generally in its freshest state, beneath the surface of the land. My experience during nearly twenty years has taught me that in *this climate, where the exhalations of the sun* during one season, the influence of wind—the effects of melting snow, and torrents of rain, during another, upon a surface made impervious by frost almost to the edge of an axe, top dressing, except where principally composed of calcareous matter, should seldom be applied. Old pastures remarkable for the excellence of their herbage, or grass lands within the reach of large towns, may be profitably enriched by the application of animal manure to the surface in the spring, when the soil is open, and the grass by pushing forth its leaves, soon affords some protection from the sun, whilst they imbibe to a certain extent, the fertilizing principle, passing off in a gaseous form.

The expedients which the *dearness* of *land*, and the *cheapness* of *labor*, have coerced certain Europeans to adopt, cannot for ages become profitable, where the farmer tills generally his own soil; and the laborer is paid, and protected, as being worthy of regard, and the wages of his toil. Compost heaps, in certain situations, may be advantageously formed. In very few would they repay the cost of chopping, turning, and scientific commixing, without noticing the loss, in this climate, at each operation, of animal matter, by the escape of its volatile parts—not the least essential of which it is formed. I am satisfied, that all animal manures should, if practicable, be applied in their freshest state—that where this cannot be done, they should be covered with earth, and exposed in the fold yard, to the treading of beasts, in order that the mass may be made compact—the air be excluded—and consequently, decomposition retarded, until its influence shall be directly applied, to stimulate plants, and enrich the soil.

The curious sheds, ingenious stercoraries, and mellow compost "pies," of which prints are given, and on which long essays have been written, I have been convinced, are adapted neither to the climate of Pennsylvania, nor to our purses nor plans.

I should be unwilling to shake off some of the prejudices, which we have imbibed, with our mother tongue: but although I do not object to cut a heavy cloth coat in an August day, after a foreign winter fashion, I am not prepared to remain a colonist, in thinking that we cannot manage our farms, without European precedent or rule.

If any man were to cultivate a large farm in this state, after the most approved scientific mode, which the agricultural doctors would have us adopt, he might expect to have an empty barn, and ere long a light pocket.

Science is essential to the agricultural art—chemistry aids it at every turn,—cooking is a chemical process; yet I should be unwilling to be fed with soup from the laboratory of the great Davy himself, unless he had been *practised* in seasoning his broth—even if with the aid of the whole college of physicians, it were scientifically compounded, as Smollett's feast of the ancients, and served in classic vases of gold. I am, very obediently, yours, &c.

JOHN HARE POWELL.

To the President of the Penn. Agri. So.

From the Fayetteville Observer.

GAMA GRASS.

Sampson county, N. C., July 20, 1833.

MR. HALE—When we were together a short time since, I promised to send you some account and description of the *Gama grass*, with the result of such experiments as I had made with it.

The first notice I saw of this grass was by Dr. Hardeman, of Missouri; whose account of its wonderful production, and valuable properties, may be found in the 8th vol. of the American Farmer, page 244. I considered the calculations, he made of results visionary, and had forgotten it.

It, however, attracted the attention of Mr. James Magoffin, of Alabama, who procured some seed, and has, now, been cultivating it several years. The result of his experiments may be seen in the 13th vol. of the American Farmer, pages 50, 143, and 215. Also, in the 4th vol. of the Southern Agriculturist, pages 312 and 475.

Further experiments with this grass are detailed by Mr. William Ellison, in the 4th vol. of the Southern Agriculturist, page 401, and the 5th vol. of the same work, page 5. To these several communications, I would refer such of your readers as have those works, for a better and more particular description of the grass, than I can give them. [N. B. Such farmers as can afford to pay the cost of the American Farmer and Southern Agriculturist, and neglect to subscribe for them, or one of them, do not deserve the benefit of any improvement or discovery in agriculture.]

The combined results of the experiments of these gentlemen show, that the quantity of hay which this grass yields is far greater than any heretofore tried. That the quality of the hay is equal to any other; and that, both when green, and when cured, it is greedily eaten by stock of all kinds. Mr. Magoffin informs us, he has actually made at the rate of 90 tons of green hay per acre in one year—equal to between 20 and 30 tons of cured hay. Dr. Hardeman states, that a single root, covering a circle, the diameter of which was too feet, yielded at one cutting 52 lbs. of green hay, which when dried weighed 20 lbs.: and consequently, that an acre of ground, filled with roots equally productive, would yield more than 270 tons of hay. However exorbitant these accounts may appear at first, the high standing of these gentlemen leaves no room to doubt their accuracy. My own experiments induce me to believe, that under circumstances, *in all regards* favorable, they may be realized.

Of the immense value of this grass, to us, in a hot climate, and on a sandy soil, no doubt can exist.

I have ascertained the following facts, with certainty. That it grows spontaneously and luxuriantly, in our country, on alluvial bottom, and rotten limestone lands. I have planted it in a poor sandy loam on a clay foundation, (such as is the general quality of the stiff pine lands of our country,) and on a sand hill, originally as barren, and as arid, as the deserts of Arabia.—These soils, *well manured*, produce it abundantly. Even the long drought of 1832 (which, with me, continued from 23d May to 1st August, with the exception of one slight rain on the 9th of July) did not materially affect its growth. It may be cut as early as the 1st of May, and the cutting repeated every thirty days, until frost. It ought to be planted in drills three feet apart, and two feet space between the roots. An acre will then contain 7,350 roots. A single root, of the second year's growth, (on the dry sand hill,) at three cuttings, has this year already yielded 7½ lbs. of green hay, and will without doubt yield at least as much more before frost. At that rate, an acre of *pure sand hill*, well manured, would yield fifty five tons of green hay, equal to about eighteen tons of cured hay, of a quality as good as the *best blade fodder*.

In January last, I drilled some seed, in drills two feet apart, with seed dropped at intervals of six inches, intended for transplanting next fall. The whole ground is now covered with a mass of grass 2½ feet high. On the 10th of this month I cut and weighed the product of one drill thirty five feet long. It yielded 25 lbs. of green hay, which, when cured, produced 8 lbs. of delightful forage. At this rate, an acre would yield 15,750 lbs. of green hay at one cutting. It may yet be cut three times more, and consequently, the product would be 63,000 lbs. of green hay, from seed planted in January last. The product of old roots is from two to three fold. These seeds are planted on pine land, with a poor sandy loam on the surface, with a clay foundation—*well manured*. I have not made any experiment with this grass, on any other soils than those above specified, but I know it grows much more luxuriantly on alluvial bottom, and rotten limestone lands.

Mr Magoffin is *certainly mistaken*, when he supposes this grass is found *indigenous, only*, in the western prairies. He furnished me with a few seeds of his own raising. I also procured some from Mr. Ellison of South Carolina, which grew in Fairfield District, and some from Gen. Owen, which grew spontaneously on his plantation in Bladen county, in this state, on the alluvial soil of the Cape Fear.*

They are all planted near each other; and are unquestionably the same species of grass. There is not the least difference between that found in this state, and that from South Carolina. That sent me by Mr. Magoffin, from Alabama, is a little different in color, being of a paler hue, and of a little finer texture.

This grass is without doubt, the "Tripsacum" of botanists. In Elliott's Botany of South Carolina and Georgia, vol. 2d, page 522, two varieties are described.

"1st. Dactyloides.—Root perennial.—Stem 4 to 5 feet long.—Leaves large, 3 feet long, 1½ inch wide.—Flowers, in terminal spikes.—Spikes numerous.—Very rare—have only seen it growing on the margin of the Ogeechee river.—Flowers from May to July."

"2d. Monostachyon.—Root perennial.—Stem, 3 to 5 feet long.—Leaves 1 to 3 feet long, 1 inch wide.—Spike, solitary.—Flowers in terminal spikes.—Grows abundantly on the Sea islands, (particularly on Paris island,) and along the margin of the salt water.—Flowers from August to October."

* A well known writer in the Newbern Spectator of the 19th instant, (H. B. C.) states that during the last year he found the Gama grass on the shore of the Neuse river, and that a gentleman in Florida assured him that he had found it in that territory.—[*Ed. of the Observer.*

For any practical purpose, there is no difference between these two varieties.—They are found growing together.

The following characteristics will render this grass obvious to common observers:

It grows in tufts or bunches, measuring about two feet across and three in height; which tufts are composed of numerous branches, springing from a common root, which is tuberous in its form for about three inches, and terminates in many small, but strong radicles. These branches, in their origin, form the common root, and have a peculiar arrangement; being produced from two opposite sides of the tuberous portion only, and departing from it at an angle in opposite directions, gives to this part of the plant a flat shape.

The leaves which (previous to the period of flowering) all issue from the root, are of a deep green color, from two to three feet long, and from one to one and a half inch wide, are shaped like a blade of fodder, but are sawed or rough on the edges, particularly towards the point. The leaves commence in a sheath at the bottom which incloses and covers the origin of several other interior leaves. About the last of May, a number of flower stems shoot up from different parts of the bunch, and grow from three to seven feet high, and terminate in one, two, or more finger-like appendages (called, by botanists, spikes.) The upper end of the spike, resembles a single spike of the tassel of Indian corn, and has a blossom (farina) on it. The seeds, (which vary from three to six on each spike) are imbedded immediately below this tassel, and when flowering, each has a single tag, of a deep purple color, resembling the silk of Indian corn. The tassel drops as soon as it has shed its pollen, and then the seeds ripen, one by one, and drop off. The seeds are imbedded on opposite sides of the stem, and attached together, after the manner of the rattles of a rattlesnake.

The flower stem is jointed and clothed with leaves, much shorter than those which proceed from the root, the sheaths of which embrace the stem to within a short space of the next joint. It is channelled on alternate sides like a stalk of corn. When full grown, it puts out branches at nearly every joint, which terminate and produce seeds like the main stem.

I have been thus particular in my description, to enable persons to search out this grass. I am satisfied it will be the source of much wealth and comfort, in our *pine* country particularly. It is *certainly* the spontaneous product of our own state. I know it grows in New Hanover, Brunswick and Bladen counties, and have been informed it is found in Craven and in Orange, and may, probably, on any of our alluvial bottoms.

Now is the time to search for it. It is in bloom and more readily identified, by the peculiarity of the seed. When not in bloom, it very much resembles some other grasses which are different in their nature, and not so valuable. I might add much more regarding it, but again refer your readers to the essays above referred to.

Very respectfully, yours, WM. B. MEARES.

SILK MANUFACTURE.

From the Boston Mercantile Journal.

One of the most gratifying exhibitions we ever witnessed is that of the silk worm in all its stages, with the mulberry leaves, eggs, cocoons, chrysalis, miller, &c. together with a complete domestic process of manufacture, which may be seen at the Agricultural Warehouse, North Market street, Boston. The machine which is there in motion was invented last winter by Mr. Adam Brooks, of Scituate, Massachusetts, and a patent of it, which we have seen, was issued on the late 29th June. It is an improvement, as it seems to us, of vast importance; for, unlike the Piedmontese wheel, heretofore chiefly used, which only performed the reeling process, *it combines the reeling and twisting;* and the saving in labor is such in consequence, that one hundred and fifty skeins can be made in a day by one woman and a little girl to turn this improved wheel, as easily as forty can by the old. This we learn from those who have tried both. One of the new machines is used in Connecticut, and another in New York, besides those in the family of the ingenious inventor, who now devote their time in a great measure to this business.

Mr. B. is one of the society of friends. His wife, who superintends the wheel, and has paid some attention to silk making for several years, had made frequent complaints of the labor lost by the old machine. Her husband doubted the practicability of amending it, and told her so in plain terms; but went to thinking, it seems, and in about three weeks produced this capital improvement. Mrs. B. says it was formerly a very hard day's work to make thirty skeins: she can now make one hundred in ordinary hours.

ON RAISING GOOD CROPS OF WHEAT AND INDIAN CORN.

From the Columbia Sentinel.

The introduction of gypsum or plaster to aid the germination and growth of clover, has produced nearly as great and desirable a change in farming, as the introduction and use of steam has in the navigation of our streams. Both have been sources of the developement of powers with which we were recently unacquainted, and while the one has fertilized and is fertilizing our fields, the other is adding to our span of life, because it enables us to accomplish more. Strange as it may seem, they are mutual aids; for while the first causes the earth to yield of her abundance, the other gives a quick transit of that abundance to places from whence we are to expect the most ample returns. Gypsum furnishes us the means of bringing land into a high state of cultivation, and of producing a rapid succession of crops which are constantly improving. Experience, the guide of the farmer, has long since established the fact, that a good clover lay well turned under, is as sure to give a good crop of either wheat or corn as it is almost possible for the farmer to insure, with all the uncertainties that are incident to his occupation, and are likely to lessen his products. The addition of stable manure is not considered essential to insure a crop, and will hardly, on some soils, compensate the farmer for the labor and expense of its application where plaster has been freely used. The point I wish to establish is this—that, with suitable management, a good crop of clover will insure a succeeding one of grain, whatever it may be, if the soil is carefully turned over and the tilth permitted to remain undisturbed, so that it may afford food for the plants that follow. But with

the growing grain neither grass nor weeds must interfere, and rob the earth of the sustenance which has been prepared with so much expense, labor and care. The crop must have the whole of it; and to permit either grass or weeds to grow is evidence of bad farming, and consequently bad policy. The best fields of wheat, and there are many of them, which are now growing in this vicinity, have been prepared in the manner before stated, and their promising appearance is abundant evidence that the course which has been pursued is a correct one. It is but lately that it has been adopted; and I have often been forcibly struck with the very perceptible improvement, not only in the quantity raised, but in the quality which has followed the practice. It is demonstrative proof that we have become better acquainted with the appetences of the plant, and furnish better supplies of the food it requires for its growth.

Another fact I have repeatedly noticed and have frequently seen most strikingly exemplified: and that is, that once ploughing of a clover sod is better than oftener. I have this year two lots by the side of each other—the soil is the same—both were in clover last year and pastured—one was only once ploughed, the other twice, and both put down to wheat. The difference now in the appearance of them is nearly one half in favor of the lot ploughed once. The same fact, under exactly similar circumstances, occurred to me last year. I was aware before that ploughing once was better than oftener, but I thought I had particular reasons for departing from the rule—the result however was the same. The observant farmers in this section of country, guided by experience, endeavor as much as possible to conform to this rule. But it is indispensable to a good crop of wheat that your land should be clear of the couch or quick grass, and likewise blue grass. It is the same with corn; but then what with ploughing and hoeing between the plants, you have a better opportunity to subdue it. I would ask our farmers to point out their best method of destroying quick grass. It is becoming very troublesome, at the same time it is extremely detrimental to the growth of wheat. I will only add that clover, besides insuring a good crop of wheat and corn, is valuable for hay. For draught horses and sheep it is superior to any other, as it keeps them in finer condition. Of this I have an experience of at least fifteen years. But for feeding cattle it is not so profitable as other hay. A.

CLOVER MANURE FOR WHEAT.

From the Hagerstown Torch Light.

The wheat crop is the most important of all crops to the farmer. A man who has one hundred acres of cleared land, of common quality, ought to raise on an average *one thousand bushels of merchantable wheat*, and rye, corn, oats and potatoes sufficient to defray the expenses of carrying on the farming. The wheat crop should always be *clear gain*.

Don't startle at this, farmer. A man who has a farm of one hundred acres of cleared land, can yearly put forty acres of it in wheat? and if the land be in order as it should be, and as every farmer may have it, every acre of the forty will give twenty-five bushels, amounting altogether to one thousand bushels. I shall now show how land must be farmed, in order to produce in this way. Never break your land before harvest, and stir it after, as is customary with many farmers. Much ploughing impoverishes land, and is productive of no good effects. Your wheat ground must be heavily set in clover, and broken up after harvest with three horses, when the seed in the clover is ripe. By thus turning clover down after harvest, when the seed is ripe, it will never miss coming up in the spring, which is frequently the case when sown in the spring with seed. You also save between forty and fifty dollars worth of seed annually, which it would take to sow your ground. When the clover is ploughed down after harvest, before you seed the field, harrow it lightly the way you have ploughed it, in order to level the ground, and prevent seed from rolling between the furrows, and coming up in rows. Never plough your seed in with shovels, nor harrow it across the ploughing, when you have turned down clover after harvest, lest you raise the clover, but always harrow it in by twice harrowing with light harrows the way you have broken up your ground. Many farmers have ploughed down clover once, and finding that the crop was not bettered by it, but injured as they believed, have never attempted it again. This is almost invariably the case the first time clover is ploughed down after harvest, especially if the fall be dry and the winter frigid and close. In turning clover down you must necessarily plough the ground deep, and the first time you turn up the clay, which being unmixed with manure of any sort on the top, is in a bad state to sow wheat on. The wheat after some time will sprout and come up, but will look yellow and very spindling. Its roots after some time will get down among the unrotted clover, and there will choke, and for want of moisture a great deal of wheat will dwindle away and die. The unrotted clover below will keep the ground wet and springy, so that the frost will injure the wheat not a little. But when the clover is twice ploughed down, the bad effects to the wheat crop arising from unrotted clover are not experienced. You then turn up the clover from below, which was ploughed down before, and which is a manure on the top. The seed sown on it now springs up directly, and before winter sets in has taken deep root. The clover now turned down rots very soon, in consequence of the rotten clover turned up, which as manure always keeps the ground moist, however dry the fall. You may now go on farming in this way: every time you turn up a coat of clover turn down one, and your wheat crop will never fail until your land becomes so rich that you will have to reduce it with corn.

I was pleased with the above suggestion, and I think it worthy the consideration of the farmer. We all know the fertilizing properties of clover, and that when mixed with the soil it is extremely congenial to the growth of wheat and corn. A good coat of it well ploughed in, is better calculated to give an ample yield than a covering of stable yard manure. Its large, rank and thick growth is likewise extremely beneficial to a succeeding crop in another point of view. It occupies the whole surface of the ground and prevents the grasses and weeds from growing, so that clover well turned in leaves the ground clear and unoccupied by the roots of other plants which interfere with the growth of wheat. In this respect wheat is a remarkable

plant; it will not thrive intermixed with any thing else; it must occupy the ground alone. But whether ripe clover ploughed in would seed the ground so as to give a succeeding crop of it, I will not undertake to give an opinion.—[*Columbia Sentinel.*

A.

MANURE IS WEALTH.

From the New York Farmer.

In our intercourse with some of the farmers residing within forty or fifty miles from New York, on Long Island, we have been surprised at the instances related to us of the profitableness of farming. Some farmers, known to have labored and toiled hard, have continued yearly to fall in arrears until they have commenced *buying* manure. Fifty-six cents are given per carman load at the landing, for the apparently worthless dirt swept from the street. This applied at the rate of twenty loads produces wealth. The very farmers who could not obtain a living by using only manure made on their farms, have, in a very few years, not only freed their farms from incumbrances, but purchased others in addition, and are now, from the yearly profit of their farms, putting money out at interest. If then it is found so profitable to *buy* manure, and be at the various expenses attending the carting, how very important is it to give special attention to increasing the quantity and improving the quality of that made on the farm. There is no question but that almost every farmer can double the quantity of his domestic or yard manure, without scarcely any additional expense. It is thought, too, that at least fifty per cent. of the nutritive properties of yard manure are lost by drenching of rain, excessive fermentations, and injudicious application to soil. The more we consider this subject the greater does it become in importance, and justly regarded as the primary object in farming.

GOLD MINES IN VIRGINIA.

From the Richmond Whig.

We hear almost every week, of new discoveries of gold in the gold region of Virginia—(which, as far as ascertained, commencing in the neighborhood of the Rappahannock in the county of Spottsylvania, trends with the mountains from N. E. to S. W., touching the counties of Spottsylvania, Louisa, Fluvanna and Goochland, on the north side of James River, crosses James River near the point of Fork and enters Buckingham, and passes on through North Carolina to the Cherokee lands in Georgia) and the letter below adds to the number. Many of the veins are extremely rich, and the gold of exceeding purity. The ore is found on or near the surface and the preparations for collecting it are so little expensive, as to have induced numbers of individuals to engage in the search. Some probably do a bad business, but many have made and are making, considerable sums. One gentleman of Goochland, we learn, made $110 in one day, from 20 hands, the mines he worked being situated in Louisa, and his average profits were thus far not much behind that average. One of the Editors of this paper last year narrowly missed making his fortune by a speculation in gold land. A tract of land in Goochland, the gold on which was reported to have been exhausted, was sold for $1110, being about the actual value of the soil. The person referred to, had been informed of the fact that there was an immense mine on the land, with the existence of which, the owner was unacquainted; but from distrust of his informant, and the fear of being laughed at, he let the opportunity escape, and the land fell into other hands. After passing through several hands, it finally fell into those of a New York company, from whom we understand it cannot be purchased for several hundreds of thousands!

We would be obliged to any scientific friend, who would take the trouble to furnish us a geological description of that portion of Virginia generally known as the gold region.

GOLD IN BUCKINGHAM.

Buckingham county, July 30th, 1833.

To the Editors of the Whig.

Sirs,—Mr. Thomas Morton & Co., digging on the west fork of Hunt's Creek, about two miles north west of Buckingham church, are getting frequently four or five dollars per day, to the hand. One day they obtained eighty penny weights, valued at 95 cents per dwt., or about 7 or 8 dollars to each hand employed, in surface gold. A large quantity of ore has also been dug up out of a pit adjacent to the branch that the surface gold has been obtained from. One man (engaged in mining,) supposes this ore worth 8 or 10 thousand dollars, or 7 or 8 dollars to the bushel. A mill will be erected to convert it to dust, for the purpose of being washed. John Mosely & Co., have very lately commenced washing for surface gold, about 300 yards south of Morton & Co., on the land of Stephen Guerrant. A few days ago, they, with 8 hands, obtained 16 penny weights, or $1,75 cts. to each hand in one day. The number of hands was so small that the washer was not constantly employed during the day. Yours, respectfully,

DANIEL GUERRANT, JR.

HORSE RAKE.

From the Columbia Sentinel.

In my last communication I spoke incidentally of the usefulness of the horse rake, as an instrument well adapted to the purpose of gleaning wheat fields. What I have farther to say of this instrument, is to enlarge upon the use for which it was specially constructed—that is, for the raking of hay; it being a substitute for the hand rake. Although the horse rake has been in partial use here for four or five years, and is extremely well adapted to the purpose for which it was intended, I have often been surprised that it is still so little used by farmers. I can only impute this to the want of knowledge of the excellent manner in which it performs its functions, and to the former slow process that information upon every important branch of agriculture becomes disseminated. There is no way of doing this so speedily as through the newspapers, and many a useful instrument is neglected, because farmers do not publicly communicate what might be extremely useful to their own profession. I venture to say to those who do not know the uses of the horse rake, that, if through this paper they only obtain the information that there is such an instrument, and are thus induced to purchase it—if that is the only benefit they obtain for one year's subscription to it, they are amply repaid for the outlay both for the rake and the paper. I speak of the patent revolving hay rake. The mode of using it, is to attach a horse to it, and the rake following,

collects the hay the length of the instrument, which is about ten feet. The horse does not stop to unload or disengage it from the hay, but it makes a half evolution and passes over the hay thus gathered. It will collect it in a much quicker manner than the hand rake, and do the work quite as well. Whenever my hay is fit to house, I start the rake immediately before the hay carts, and one man and horse will gather it much faster than two carts and five or six men can convey it from the field, even if the barn is in the centre of it. To say that it is worth as much as the labor of one man, which is equal to a dollar a day, is not giving it credit enough: it does more than this. For besides what it saves in the mere labor by enabling you to gather your hay in a short time, you may by despatch in some measure avoid showers, and have the benefit of a long day of sunshine. For large farmers who have clean fields, it is particularly useful; and those who have not yet obtained a rake cannot do better than to purchase one at once, as now is the season for using it, and in the labor and time saved, they will be amply and immediately rewarded.

Farmers, upon subjects of agricultural improvement, are slow of belief; and perhaps this is right, as it prevents imposition. But at the same time we must not permit ourselves to be positive losers, because we do not choose to believe in modern improvement. If we are at all attentive to what passes around us, we must be satisfied that it is so, and our observation will tell us that there is room for yet a great deal more. We have only to look back and see what improvements have been made in agricultural instruments within the last thirty years. For instance, in harvesting: the instrument first used was the sickle—then a Dutch instrument called the *Seight*—then the half cradle—and lastly, the cradle. See what improvements in the construction of ploughs, to lessen the draught, whilst they perform the work more perfectly. In wagons single and double, for it is not many years since the *wood-shod* sleigh was used here to bring in the harvest. I have seen this in my time, and I do not look very far back. The first wagons made were shod with wood, instead of iron. The Turks still use a very rude plough; it being nothing more than a part of the body of a tree, shaped like a plough, with a limb left behind for a handle, and a cow and an ass yoked for drawing it, and a woman commonly attends as a driver. This we would call primitive farming. It is so. With them farming has not advanced in the lapse of years. They are not susceptible to improvements, as they are wedded to old customs, and think God would be angry were they to farm better than their ancestors. I am sorry to say a few about us have some such notions. Let us cast them aside—march up to the intelligence of the age, and throw mind as well as body into active employment. We were not made like the ox and the horse, merely for bodily labor. Let the head assist the hands, and our employment will be both more pleasant and profitable.

A.

From the New York Farmer.

ON THE CULTIVATION OF RYE.

To the Trustees of the Essex Agricultural Society.

Haverhill, Sept. 22, 1832.

Gentlemen—Having for some years past been more than commonly successful in raising large crops of winter rye by a process of cultivation which I believe is entirely new, I have been induced, by the suggestion of some gentlemen whose judgment I very much respect, to submit for your consideration a statement of the mode of culture, with the produce. And that the success of the experiment this season may not appear to be altogether accidental, it will, perhaps, be as well to communicate the result of the process for the three or four previous years.

The land on which the experiment has been conducted is situated on the Merrimack, about a mile and a half east of Haverhill bridge; and came into possession of my father in 1827. The soil is a sand, approaching to loam as it recedes from the river. Perhaps the term *plain land* (by which it usually passes) will better convey an idea of the quality of the soil. It is altogether too light for grass. The crops we find most profitable to cultivate on it are winter rye, Indian corn, potatoes, and to some extent turnips. Oats might probably be raised to advantage, were it not that the land is completely filled with the weed commonly called charlick, which renders it entirely unfit for any spring crop, excepting such as can be hoed. The crops of rye on the neighboring soil of the same nature, vary, I believe, from seven or eight to twelve or thirteen bushels per acre, according to the cultivation, and their approximation to the river. We usually raise on land from thirteen to thirty bushels of Indian corn per acre. Potatoes are very good in quality, but the quantity is quite small; not sufficient to be profitable, were it not that the land is very easily cultivated.

In the summer of 1827, we sowed three bushels of winter rye near the river, on about two acres of land which produced twenty-eight bushels.

In 1828, we sowed four bushels on four acres of land running the whole extent of the plain from the river. This piece was sowed in the spring with oats; but they were completely smothered with charlick, and about the middle of June, the whole crop was mowed to prevent the charlick seeding. By about the middle of August, a second crop of charlick having covered the land, it was ploughed very carefully, in order completely to bury the charlick; and then suffered to remain until the 15th of September, when we began sowing the rye in the following manner. A strip of land about twelve yards wide was ploughed very evenly, to prevent deep gutters between the furrows, and the seed immediately sown upon the furrow and harrowed in. Then another strip of the same width, and so on, until the whole was finished. We found the oat stubble and charlic entirely rotted, and the land appeared as if it had been well manured, though none had been applied to this part since it had been in our possession. The rye sprung very quick and vigorously, having evidently derived great benefit from being sown and sprouted before the moisture, supplied by the decaying vegetable matter in the soil, had evaporated to any considerable extent. This crop produced one hundred and thirty-three bushels.

In 1829, the charlick was suffered to grow on the land appropriated to rye, until it had attained its growth and was in full blossom. The land was then ploughed very carefully, and the charlick completely covered in. In a short time a second crop appeared more vigorous than the first. This also was allowed to attain its growth, and then

ploughed in as before. A third crop soon appeared, which of course was destroyed, when the land was again ploughed for sowing about the middle of September. This piece of land was a parallel strip running from the river, and containing two acres. Two bushels of rye were sowed. The crop presented a remarkably promising appearance, and yielded seventy-four and a half bushels.

In 1830, the land appropriated to rye included nearly all the lighter part of the soil, and owing to a pressure of business was not attended to as we could have wished. It was ploughed in the early part of the summer. But harrowing to destroy the weeds was substituted for the second ploughing. This, and the unusual blight which affected all the grain in this part of the country, led us to anticipate a small crop. It yielded, however, fifteen bushels to the acre.

The land on which the crop of rye was raised the present season had for the three or four previous years been planted with Indian corn: and owing to the extent of our tillage land, we have not been able to apply more than four or five loads of manure to the acre this season. The charlick was suffered to attain its growth as usual; and on the 13th and 19th of June, it was carefully ploughed in. The second crop was ploughed in on the 6th and 7th of August. On the 14th and 15th of September it was sowed in the usual manner, namely, a small strip of land was ploughed, and the seed sown immediately upon the furrow, and then harrowed in. Then another strip of land was ploughed, and so on until the whole was completed. One bushel per acre was sown as usual. The seed was originally obtained from a farmer in this vicinity, and I suppose is similar to that which is generally used. We have never prepared our seed in any manner, but have directed our attention solely to the preparation of the land; and to this we attribute our success. Owing to the unusual severity of the winter, the crop was considerably winter killed, but recovered very soon in the spring, excepting in the mid-furrows. There, as the land lies very level, the water settled, and so completely destroyed the rye that they continued bare the whole season. This would of course cause some diminution in the crop: perhaps a bushel or two. The rye was reaped at the usual season, and as the weather was favorable, immediately put into the barn. The land contained one acre and thirteen rods, and yielded *forty-six bushels and three pecks. A remarkably fine sample.*

In entering a claim for your premium, I would ask your attention particularly to the process of cultivation. It is, I believe, entirely new, and capable of general application.

Sowing the seed immediately after the plough we consider very advantageous to the crop. The soil being then moist, causes the seed to spring immediately, and gives a forwardness and vigor to the plants which they ever after retain.

The process of ploughing in *three* crops of weeds before the seed is sown, very much enriches the soil. It would be altogether unnecessary to attempt to refute the notion, that by such a process nothing more is applied to the soil than was before derived from it. If one could not discover by the light which chemistry has shed upon the subject of agriculture, sufficient *reasons* for the contrary conclusion, observation, one would think, would be sufficient to convince any intelligent man of the fact.

And here I would suggest, that I do not consider the experiment, as we have conducted it, quite complete. To render it more so, in the first place, in ploughing in the weeds, I would not turn a furrow after the dew had evaporated. I have no doubt but that a large portion of that fertilizing quality in the soil, which (during the summer months) is continually exhaled from the earth, is by the dew brought again within our reach, and it would be wise to avail ourselves of the opportunity of again burying it in the soil. And in the second place, I would by all means use a heavy roll after each ploughing. It would fill all the cavities left by the plough, and by pressing the soil more closely to the weeds, at once hasten their decomposition and very much retard the evaporation from the soil.

But the land is not only very much enriched by this process; there is, I conceive, no method by which it can be so effectually cleaned. Three times during the season a fresh surface is presented to the atmosphere, and each time, as the decaying vegetable matter increases in the soil, so is the exciting cause augmented to make a more vigorous effort. We have in this manner gone over nearly all our land which is infested with charlick, and the diminution of the weeds is quite sufficient to warrant the expectation, that in a few years it may be comparatively eradicated.

Very respectfully, JOHN KEELY.

The undersigned having assisted in measuring the rye, an account of which is given above, hereby certify that the quantity is as there stated, namely, forty-six bushels and three pecks.

JOHN KEELY,
THOMAS E. KEELY,
SAMUEL THOMPSON.

Haverhill, August 1st, 1832.

I have, this day, measured a lot of land belonging to Mr. Keely, on which is a crop of rye, and find it to contain one acre and thirteen rods.

C. WHITE, *Surveyor.*

At a meeting of the Trustees of the Essex Agricultural Society, January 1, 1833, the foregoing statement having been read and examined,

Voted, That the first premium offered for the cultivation of rye, be awarded to Mr. Keely.

Attest, J. W. PROCTOR, *Secretary.*

APPLICATON OF GEOLOGY, AS THE BASIS OF THE SCIENCE OF AGRICULTURE. *By Professor A. Eaton.*

SOILS.

An error of importance had prevailed among geologists, on the subject of the origin of soils, until a classification of detritus was established. Cuvier's theory of the earth did much towards the present improved state of that department of geological knowledge. But Schoolcraft suggested the first thought ever published, on a classification, which is in accordance with the present views of geologists on that subject; though his nomenclature was different.* Near the same time, Conybeare, Buckland and others, gave a character to it, which will endure.

It seems to be demonstrated, that anti-deluvial detritus (called the tertiary formation) is a deposite, as independent and distinct, as secondary rocks. It cannot be traced immediately to any adjoining rocks. Consequently its character cannot be ex-

* See my index to the Geology of the Northern States, 2d ed. 1820.

plained by referring to other strata; unless we admit the general principle that all deposites, made after the deposition of the lower part of the argillite, consist of fragments of the older rocks.

The principle heretofore received then, that soils depend for their constituent characters on underlaying rocks, cannot be received any farther than as applied to *analluvion*. All other kinds of soil have characters as independent as transition or secondary rocks; and they may be classified now, with as much accuracy.

FERTILITY OF SOILS.

1. Fertility of merely earthy soils does not depend on their ultimate chemical elements. Pulverized emery, which is almost pure alumine, will have the same influence upon vegetation as pulverized quartz, which is nearly purely silex. Hence the reason that Davy, and other distinguished chemists have disappointed agriculturists by their analyses; which were founded on such mistaken views.

2. The perfection of earthy soils, without any reference to animal, vegetable, or other adventitious matter, requires the following constituents in due proportion: 1. *Stones* and *pebbles* sufficient to keep the soil open and loose. 2. *Clay* sufficient to absord and to hold water in a just proportion. 3. *Fine sand* in sufficient quantities to prevent the clay from baking into a compact mass, in time of drought. Also to prevent its retaining so much water in the winter season, as, by expansion during the freezing of the water, to draw the roots of vegetables from the earth—called the winter-killing process.

To select a farm for purchasing, or to improve land by artificial means, without the application of manures, requires particular attention to these proportions.

Vegetables receive their chief support from the atmosphere; and the whole of it when they grow in clean, pure, unmanured earth. Neither dry sand nor baked clay will absorb the nutritious gases. Duly moistened earth absorbs carbonic acid, ammonia, and other nutritious gases, which are received from the soil by the fibrous rootlets, for the use of plants. Charcoal and other carbonaceous matters, absorb these gases with great avidity. Hence the great value of carbonaceous manures, as rotted straw, charcoal, &c. But a due proportion of moisture is essential to absorption in all cases. Hence the importance of an attention to soils in reference to the absorption and retention of water. Hence too the importance of frequently stirring and disturbing the dry surface of the soil, in time of drought, by hoeing, ploughing, &c., in order to present a moist surface to the atmosphere; without which, nutritious gases cannot be absorbed.

Carbonate of lime, sulphate of lime, and all the soluble salts, as well as putrifying vegetables and animals, should be considered as manures. They all act either as absorbents like charcoal; stimulants, like gypsum, muriate of lime, &c.; or as furnishing nutritious matter by their decomposition, like fish, rotted straw, &c. Therefore the geological agriculturist studies chiefly the proportions of *stones*, *pebbles*, *clay* and *sand*. The study of that part of geology which relates to *detritus*, is the true study of the first principles of elementary agriculture.

By a reference to the system of classification, in the preceding part of this text book, it will be seen that all detritus is distributed into eight deposites. 1. Plastic clay. 2. Marly clay. 3. Marine sand. 4. Shell-marl. 5. Diluvion. 6. Ultimate diluvion. 7. Post diluvion. 8. Analluvion. After studying the character of these deposites, nothing more is required than a mere application of common sense to each particular case.

CLASSIFICATION OF SOILS.

1. *Plastic clay.* This stratum is rarely found at the surface of the earth, except at its out-croppings in banks. It is destitute of any material portion of carbonate of lime—being the clay used by potter bakers. Without any intermixtures, it would bake in the dry season, and be running mortar in rainy weather. Intermixed with marine sand, it would be tolerably productive. Wheat winter-kills in it more than in any other soil.

2. *Marly clay.* (London clay.) This stratum is almost universal in bottom grounds. Alone, it bakes, in a drought, and is mortar in a wet season. Wheat winter-kills in it. But it generally contains from fifteen to twenty per cent. of carbonate of lime, and considerable muriate of lime. Wells dug in it, almost invariably furnish "hard waters," on account of the muriate of lime. These salts give it richness. Therefore if it is duly mixed with marine sand (which generally overlays it) it forms rich and very durable soil. From near Lake Champlain to Greene county, on the west side of the Hudson, this clay, overlayed with marine sand, prevails. Also throughout most of the northern part of New-Jersey, along the valley of the Mississippi, &c. If the vast plains of *marine sand*, between the Mississippi and Rocky Mountains, are generally underlayed with this clay, as they certainly are in some localities, next century may, under the hand of culture enliven that barren waste with fruitful fields.

3. *Marine sand.* (Bagshot sand.) This stratum alone is a meagre barren soil; but makes an excellent kind when duly intermixed with the marly clay beneath it, as mentioned under marly clay. This stratum often passes into crag, or stratified gravel, hardpan, &c. The crag is a better soil alone, than the sand, excepting the hardpan and some other varieties, wherein the gravel is held together compactly by ferruginous, calcareous or clayey cement. But if duly intermixed with the marly clay, it forms a good soil.

4. *Shell-marl.* This deposite is a most excellent manure, when intermixed with any of the other soils—best in soils where clay predominates. It is chiefly carbonate of lime; but being made up of broken shells or minute species, it is always in a state suited to its application as a manure. But when alone, it is not very productive, especially in a dry season.

5. *Diluvion.* As this deposite is the most heterogeneous of all deposites, it presents the characters of most other soils. In general it is very rich in vegetable manure; but it is often too loose, and requires an artificial intermixture of clay. It presents all its characters along the Erie canal, between the Little Falls and Genesee river. It frequently affords localities of vegetable mould, which may be advantageously carted upon other soils. As it is generally in narrow slips or small fields the surrounding grounds may receive its benefit with but little carting.

6. *Ultimate diluvion.* This seems to have been a thin universal mantle, covering the earth in the first ages after the deluge. It still remains undisturbed in the most ancient forests. But in all cultivated grounds, has been intermixed with the underlaying soils. In its undisturbed state, it is the soil to which the word *loam* is most properly applied. Alone, it is a durable and rich soil, excepting where sand predominates. Mixed with other soils, it is always useful.

7. *Post diluvion.* Near the sources of the waters which deposited this soil, it is always too coarse and destitute of any fertilizing quality—remote from these sources, it is fine and rich—midway between these extremities, it is middling in character. But post-diluvion is, from the nature of its origin, exceedingly variable—every locality depending on the deposites from which the waters flowed.

8. *Analluvion.* This kind of soil is perpetually forming by the disintegration of rocks, whose surfaces are exposed. Its character depends entirely on the constituents of the rock. Therefore argillite and argillaceous gray wacke produce by disintegration, clay soils. Rubble wacke, granular quartz, and other quartzose rocks, produce sandy soils. Hornblende rocks produce a rich intermixture.* Limestone rocks, particularly argillaceous limestone, as the geodiferous limerocks, produce a rich calcareous and aluminous soil.

Broken fragments of rocks disintegrate and become soils with a degree of rapidity, directly as the superficial measure of surface exposed to the disintegrating agents (water, air, and variation of temperature) is to their quantity of matter Consequently lands may be suddenly enriched by throwing upon them limerock, hornblende rock, (whether basaltic or primitive) argillite, &c. in a finely pulverized state. Or they may be gradually and permanently enriched by scattering over them broken fragments, one inch, or two inches in diameter. The rock must be selected according to the original components of the soil ; so as to supply what appears to be deficient. Tabular spar (a fragile variety of carbonate of lime, or limerock) which abounds along the western side of Lake Champlain, has recently been applied, with astonishing success, in the finely pulverized state. In the fragmented state, it had been applied for several years, to great advantage. No farmer is more opposed to mere speculative theory than myself; but facts place the advantages of strewing soils with pulverized rocks and fragments, beyond the reach of speculation.

GEOLOGICAL ANALYSIS OF SOILS.

The chemical analysis of soils with a view to detect their ultimate elements, has promised much—particularly in the hands of Davy. But it has, in all cases, disappointed the hopes of the practical farmer, for reasons given under Fertility of Soils. It is to the geologist, not the chemist, that the practical farmer must look for instruction; so far as *mere soils* are to be considered. The detection and application of stimulating earths and salts (as gypsum, lime, &c.) and of decomposed or decomposible vegetable matters, come within the province of the chemists.

Chemical analyses of soil, like other analyses of mineral bodies, give the ultimate elements in a manner which is favorable to the pursuits of the student in chemistry and chemical mineralogy. The complicated mixtures of soils afford an excellent field for trial of his strength in his first essays at analysis. This is, however, widely different from those researches and investigations, which the impatient anxiety of the farmer demands. The student is pleased with results, which evince the correctness of his preconceptions, and the adroitness of his manipulations, regardless of utility.

But those analyses, which belong exclusively to the chemists, detect fugitive and variable materials, which are not to be considered as a part of permanent soil. They may be varied from year to year at pleasure ; and their proportions may be calculated as they are artificially varied, or they may be detected and estimated by the chemist after they are added. As vegetable and animal matter is a geological deposite, easily detected and always present in a greater or less proportion, it should be considered as a part of geological analysis.

Geological analysis of soil may be made, by pursuing the course of geological deposition in miniature. That is, soils may be deposited from water, in the assay glass or a common tumbler, after suitable preparations, so that the proportions of silex, alumine, animal and vegetable matter, water of combination, and power of absorbing, may be shown. These are the most important subjects of inquiry when the object is to improve the soil, or to judge of the best method of culture, or of the most profitable articles to be cultivated on particular fields or farms. The elevation of grounds, above the level of the ocean, and the degree of latitude, are also subjects of great importance. Humboldt's Equivalents, deduced from comparing the effects of high latitudes with mountain elevations, should be duly applied.

Formula for Geological Analysis of Soils.

1. Select about one quart of soil which shall appear to be an average of the field. Spread it out and make it as dry as it can be made by the sun's heat, after thoroughly intermixing all parts of it.

2. Pulverize it as fine as can be done by rubbing in the hands. Take half of it, and pick out, by the assistance of shaking in a dish, all roots, straws, &c. also all pebbles or grains over the size of a common pinhead.

3. Weigh out, of the finest of it, with accurate scales, three parcels of 200 grains each. First, for determining the water of combination. Second, for detaining the animal and vegetable matter. Third, for determining the silicious matter; or rather, the earthy part which does not combine with water excepting by superficial attraction of adhesion. The same parcel is also employed for determining the aluminous part, and the power of absorption.

4. Heat the first parcel in a crucible, or gallipot

*Dr. E. James observes, (see Long's Expedition, vol. 2. p. 402,) that in the midst of the Great Desert near the Rocky Mountains, where all was "brown and desolate, as if recently ravaged by fire," the hills of green-stone trap, which consist essentially of *hornblende*, were covered with a green turf from their bases to their summits. This is a discovery of more value to agriculture than all that Sir H. Davy ever made ; though to the mineralogist and chemist they are useful. But who knows the modest, the amiable, the excellent Edwin James? New England might be enriched by an attention to this subject—and would too, had Davy told us this fact.

constantly stirring it with a dry pine stick, until the stick becomes a little brownish from the heat, when pressed against the bottom of the crucible. Now weigh it, and set down the loss for *water of combination*.

5. Heat the second parcel, stirring as before with a glass rod or slip of window glass, until it is at a red heat, and no glimmering sparks to be seen. Weigh it, deduct the weight of the water of combination, and set down the remainder of the loss for *animal and vegetable matter*.

6. Put the third parcel into a pint of pure water. Stir it repeatedly for about ten minutes. Let it stand precisely three minutes for the silicious matter to settle. Pour off into another vessel all the supernatant liquid and its contents. Add another pint of water to the silicious sediment. Let it settle just three minutes as before. Pour off all the supernatant liquid again. Dry the sediment about as dry as when weighed. Weigh it, and set it down for *silicious matter*.

7. Subtract the sum of the weights of the *water of combination*, the *animal and vegetable matter*, and the *silicious matter*, from 200 grains, and the remainder set down for *argillaceous matter*.

8. Pour into one glass vessel the two portions of supernatant liquid, which had been poured from the silicious matter, and note the time required for settling, so as to leave the liquid clear. Set the time down for *power of absorption*.

Analysis made by Dr. T. R. Beck and myself, of soils taken in the vicinity of Albany and Troy.

Upland loam. Absorption, 4 hours in settling. Water of combination, 4 per cent. Animal and vegetable matter, 5 per cent. Silicious matter, 68 per cent. Aluminous matter, 23 per cent.

Best lowland loam. Absorption, 3 hours in settling. Water of combination, 4 per cent. Animal and vegetable matter, 12 per cent. Silicious matter, 58 per cent. Aluminous matter, 26 per cent.

ON PAINTING HOUSES.

From the Southern Planter.

Starvation Farm, Feb. 12, 1833.

Sir,—We use paint on our wooden buildings with two objects: first, ornament; second durability. Was oil used by itself, without any coloring matter, the wood would be made more durable than it is with paint; but as ornament is a considerable part of the object of painting, and as the addition of paint to the oil, when properly prepared, does not very materially injure the preservative qualities of the oil, the ornamental effect of the coloring more than counterbalances the injury it does. Paint, when properly prepared, therefore, while it is highly ornamental to wooden buildings, so materially contributes towards their durability, that there is economy in using in. But as it is generally prepared, (I may say always,) the ornamental effect of it on the outside of buildings is made only temporary, and its preservative qualities wholly destroyed. It is only necessary to look at our quickly decaying wooden buildings, with the paint washed off more or less in different places, according as it is exposed to the sun and rain, to be satisfied that the expense of painting has added very little towards preserving the building; and whether a building looks better without paint, or with paint nearly all washed off, with here and there a little remaining to show that it once was painted, taste must determine. If what I have stated be a fact, that paint as mostly prepared, is of little value, it will be well to look into the cause of it, that the evil may be remedied; and if I give the correct cause, happily the evil is removed without expense or trouble; or rather, it is cheaper to paint well than in this defective manner. We have only to leave out the spirits of turpentine, and we will have good paint. Ask the painter why he adds it to the paint, and he will tell you to make it dry quick. This is just the same as saying, to destroy the oil, which renders the paint useless. Now let us reason upon it and see if this is correct. If we pour oil on wood it soaks into it, and after it is all soaked up, if we apply more oil it will strike still deeper and soak up more; when it has penetrated sufficiently deep into the wood as to prevent moisture from rain, &c. penetrating as deep as itself, the wood is rendered very lasting. This would be the case if the building was simply covered with two coats of oil without paint. If we give it only one coat of oil, with a sufficient quantity of paint to give it color, the wood would so quickly soak up the oil that the paint would be left a dry powder on the building, that would be easily rubbed or washed off. If we give it first a coat of oil with a little paint added to it, the oil soaks into the pores; another coat of oil with the proper quantity of paint, while the pores are filled with the recently put on, or first coat, remains sufficiently long before the oil is soaked up by the pores, for a part of it to dry with the paint, which forms a permanent covering of paint. This is the advantage of giving two coats of paint; if the first coat was oil only, it would be better. When a house is thus painted, all the injury done by the paint is the oil which it retains and prevents from soaking into the wood, and this is in part, perhaps wholly, counterbalanced in forming a firm external covering which tends to exclude moisture; thus painted a building is preserved and ornamented. Now what will be the effect of adding spirits of turpentine to the oil? We know of nothing better calculated to destroy our intentions in the use both of the oil and paint than the addition of turpentine. Every housekeeper knows that if oil is on her floor, spirits of turpentine is the application to remove it. Every wash-woman knows that if oil is on her clothes turpentine is the application to remove it; and how does it remove it when the oil and turpentine are added together? A chemical union takes place and the qualities of both are destroyed, and although either the oil or turpentine by themselves when applied on wood would add to its durability, yet when added together the original quality of both is destroyed, and the application is useless, just as an acid and alkali, when mixed together, destroy the qualities of each other and the effect of neither remains. Now when a building is painted with two coats of paint to which spirits of turpentine is added, instead of the first covering of oil, (which has very little paint,) being soaked up, and the second covering, as the pores are already fed, soaking up the oil so slow that a part of the oil may dry in the paint, thus making a firm coat of paint on the surface, which will exclude moisture and prevent the evaporation of the oil, thus making the wood almost as lasting as time, and the color to remain as long as the wood lasts; what will be the effect of this addition of spirits of turpentine? The oil is

decomposed, and instead of soaking into the wood and slowly drying in the paint to give a firm covering, it is quickly evaporated by the sun, the paint is left a useless powder on the wood; where it is not sheltered from the rain, it is soon washed away; and in places where it only gets wet without being washed off, as the qualities of the oil are destroyed, it retains moisture and hastens decay. We have only to go to a house which was painted white, and examine the somewhat sheltered spots where they get wet by showers, yet the rain does not beat upon them so as to wash off the paint, and scratch off the paint, and we will find the surface in a state of decay from the paint not excluding moisture but retaining it. When pine wood is painted it should more especially have only oil and paint without the spirits of turpentine, as there is in the wood turpentine sufficient to injure the oil. If we examine the shingles or weather-boarding of a house, we will find wherever there is a knot or *fat place*, there the oil is decomposed by the turpentine in the wood, and the paint destroyed, even where no spirits of turpentine was added to the paint.

Does not this truth, which I believe all will allow, that turpentine makes paint dry quick prove that instead of soaking into the wood the oil is decomposed and evaporates, show the destructive effect of this addition of spirits of turpentine to paint, and although the inside painting of houses remains when turpentine has been added, yet it would be more durable if the turpentine were left out. The oldest paintings we have, appear as warm and glowing as when first executed, while the paintings of the first masters of modern times are injured, mostly as I think by the free use of turpentine. The fine paintings even of Sir Joshua Reynolds are losing their beauty. By some it is supposed that the paints used now are not as good as they were in former days. 'Tis not the fault of the materials, but the preparation. Oil, for instance, and white lead are as good now as they ever were, and were they used without turpentine or any thing else, as the painters say to make them dry, (or as we say to decompose the oil and destroy it,) would last as long and be as good as they ever were. If we calculate the annual amount of money used in the purchase of turpentine, and to this add the amount of loss from the injury it does, we will find it an enormous expense. From such trials as I have made, I believe the oil of palma Christi to be superior to flax-seed oil for preserving wood. If the two oils be put on wood, the palma Christi oil will be found much more difficult to remove by decomposing with turpentine, which is proof it will be most durable. Palma Christi oil, when properly prepared by boiling, is as clear and as good as cold pressed oil. A good acre of land will produce from twenty to thirty gallons of it. Planters who wish to paint their buildings, would be able to make the best of paint oil, by cultivating a few acres of it, and when durability more than ornament is the object, as in out-buildings, gates, &c. giving them two coats of palma Christi oil, without paint, would have the desired effect. The posts of my pigeon house, which were dipped in hot palma Christi oil before they were put in the ground, look like they would last for generations to come; while the posts about the yard, garden &c. are considerably decayed. Was the exposed six or eight inches of shingles dipped in a hot pot of palma Christi oil, the expense would be a trifle, and they would be very lasting. Some years ago, by neglect, a pot of oil, with which I was experimenting, was spoiled by burning; the roof of the house was quite low, the building being deep in the hill side, I threw the oil on the house roof; in taking this house down a few days ago, these shingles were found as sound and clear of moss as when put on, while the others were much decayed. But the durability thus obtained would not be the only object; it is known that old shingles become covered with a kind of mossy growth; this growth is nearly as quick to take fire as spunk; the smallest spark that falls upon it when dry may take fire. Perhaps nine out of ten houses that take fire from sparks falling on the roof, do so from this mossy growth, which never is produced on wood that is oiled; were shingles dipped in hot oil before putting them up, it would be a preventive from fire from sparks. A few days ago, during almost a calm, at midday, when only a few coals were in the fire place, my house roof was discovered to be on fire. As there was no ladder nor any way of getting at the fire, it seemed as though the house would burn down. A very strong man, however, by getting in the window of a house not far off, was able to deaden the fire a little by throwing water with great strength; some drops would reach the fire; thus some little time was given for reflection. A man of great muscular strength with a small hatchet commenced cutting through the ceiling and sheeting. The fire began to blaze, the wind began to rise, all hope of extinguishing the fire was gone; he had however cut a hole through, and was able to tear off the boards and put out the fire. These shingles upon examination were found sound, but they were covered with this mossy growth. A very small spark must have set it on fire, for upon trial it was found almost as quick to take as gunpowder. Had these shingles been dipped in oil before they were put on the house, I would have been safe from such an accident, not only now but for many years to come.

ROBERT R. HARDEN.

MANAGEMENT OF BEES.

From the Genesee Farmer.

Messrs. Editors,—In common with many others whose pursuits and tastes allow them to devote but little attention to scientific or practical agriculture and its sister occupations, I yet take much interest in the progress of agricultural improvement and the developements of our rich and, to a considerable extent, unappropriated resources, and am desirous as one of a common fraternity to contribute any thing in my power to the promotion of this object. It is this motive that has induced me to mention the following incident which occurred in our western N. Y., on the authority of a gentleman of unquestionable veracity, who was knowing to it, and if you deem it worthy of publication it is at your service for that purpose.

A farmer having a large number of bees, had from one of the hives, late in the season, a very small swarm, and not wishing the trouble of nursing it himself, told one of his neighbors that if he had a mind to take it and treat it with sufficient care through the winter it would make him a very good swarm in the course of the next summer. His neighbor not having any, and desirous of com-

mencing an apiary, took the diminutive hive, and as soon as cold weather set in, he placed it in the common apartment of his log hut, which was constantly kept warm, and every day they were fed upon molasses, or sugar, spread on wheat bread, which they would come down, as regularly as chickens when called, and eat from his hand, and at the same time they appeared to be continually busy in the hive. As soon as spring opened he set them out doors, and shortly afterwards they sent out a swarm, which was rapidly succeeded by five others, from the parent hive, all of which had left the hive *before there had been a single swarm from his neighbor's bees, although he had more than forty hives.* One of these new swarms afterwards swarmed again, which made an increase in a single summer from one to eight swarms of bees—all in consequence of the trivial attention bestowed on them through the winter.

Buffalo, 10th July, 1833.

ON THE DURATION OF VITALITY IN GARDEN SEED.

From the Southern Agriculturist.

Rocky Grove, Abbeville District, March 19, 1833.

DEAR SIR,—I send you a few extracts from my note book on gardening, which you can use as you think proper.

Question—How many years old will Carolina grown seeds vegetate in Carolina?

Answer—Cabbage. 2 years—not one the third year; two experiments.

Civie Beans,	2 years,	do. do.
Musk Melon,	4 years,	not one the fifth year.
Cucumbers,	4 years,	do. do.*
Water Melons,	4 years,	not tried further.
Pumpkins,	4 years,	do.
Squashes.	3 years,	do.
Snap Beans,	2 years,	do.†
Carrots,	2 years,	do.‡
Okra,	3 years,	do.
Tomatoes,	3 years,	do.
Turnip,	5 years,	do.
Radish,	3 years,	do.
Onions,	2 years,	do.
Lettuce,	3 years,	do.
Endive,	3 years,	do.
English Peas,	2 years,	do.
Water Cresses,	2 years,	do.

I have observed a difference of ten days in sprouting, between old and new seed in favor of the latter; the old seed sometimes takes fifteen days to vegetate. Respectfully,

THOMAS PARKER.

* Cucumber seed, five years old, planted in a common garden soil—not one came up—planted in a dung hill, and watered morning and evening, came up perfectly well on the fifth day.

† In filling up the cracks of a log-house with clay in this neighborhood, a small bag of snap beans was accidentally enclosed between two logs in the clay. This clay was removed fifteen or twenty years after, when the bag of beans being discovered, they were planted by way of experiment, and the greater part of them vegetated.

‡ Three small beds of carrots sowed by way of experiment in June. Bed No. 1, was watered in the evenings and afforded a fair crop of carrots. Bed No. 2, watered morning and evening—scalded by the sun and destroyed. Bed No. 3, watered morning, noon and evening—these advanced in growth rapidly ahead of No. 1, and were remarkably large and fine.

INTERNAL IMPROVEMENT OF NORTH CAROLINA.

Address of the Committee. To the people of North Carolina.

A numerous and respectable portion of your fellow citizens, who assembled at this place on the late Anniversary of American Independence, to consult on the means of improving the condition of the state, have directed us to lay before you the result of their deliberations. Without pretensions to authority or the wish to obtain it, without party or sectional views of any sort, and with no influence save that of reason, we claim your attention simply because of our communion of interest with you on a subject of deep and abiding importance, and because of a sincere and hearty zeal to advance the prosperity of our common country. Nor do we deem it too much to hope that, even at this moment, amid the din of political strife and the struggles of contending candidates for your favor, these claims will not be disregarded by an intelligent and well meaning community.

North Carolina is endeared to us by every tie of nature and every obligation of duty. Her advancement in whatever is great and good is inseparably interwoven with our hopes and wishes, our patriotism and our pride. Keen, therefore, is the mortification, to be obliged to confess that she is falling behind several of the states of the glorious confederacy, in that career of distinction to which all were invited by the bounties of Providence, the freedom of the American institutions, and the capacity of the American people. Forty-four years have passed away since, under the auspices of the Federal Constitution, she entered upon this generous competition. In extent of territory she had then the advantage of New York and of Pennsylvania. Excluding their principal cities, she was not inferior to either of them in wealth. In free population she nearly equalled New York, and was but a third less than Pennsylvania. Her superiority in extent of territory yet remains, but in all other points of comparison how changed is the scene! Her free population is now to that of Pennsylvania as one to three, and to that of New York as one to four, while in wealth she bears to each of them but the ratio of one to six. In New York and Pennsylvania, colleges, academies, scientific and literary institutions are spread throughout the land, presenting the opportunities of acquiring a finished education to those who have the means to procure this invaluable blessing; while ample provision has been made by law for communicating necessary instruction to every child in the community, however poor and destitute. In our state, notwithstanding the injunction in our constitution and except in the erection of the University and in the incorporation of a few academies, either without funds or with funds not derived from legislative grant, NO public schools have been established 'for the cheap and convenient instruction of youth.' In Pennsylvania, more than seven hundred miles—in New York, six hundred miles, of canal navigation have been created, while railways are every where in the process of construction, stimulating and employing labor, mak-

ing and diffusing wealth throughout their widespread borders. Their seaports are crowded with vessels; their mechanics find constant employment and high wages; their manufactures are prosecuted with still increasing skill; and their agriculture is beautifying and enriching the soil, at the moment when it gathers the rewards of industry. There, hospitals for the sick and the insane—asylums for orphans—institutions for the cure and instruction of the blind—schools for the deaf and dumb—and other beneficent establishments for the removal and mitigation of human woe,—delight the eye and elevate the heart of the beholder—fit offerings of gratitude from a prosperous community to the Father of the human race for his blessings on our exertions, and mute but expressive solicitors for a continuance of his bounty to those who delight in doing good to the children of men. How are all these things in North Carolina? Fellow-citizens, we do not require your answer, nor do you need information from us. *You* know how they are—and *we* forbear to speak. It is sufficiently mortifying to discover, it were too painful to dwell on, the humiliating contrast. Indeed, did we not hope that this reproach would ere long be removed from amongst us, we should endeavor to bury it in thick night, hide it from the world, and, if possible, forget it ourselves. But we trust that a blessed change is in store for us. We know that there are difficulties, and serious difficulties, to be encountered—but we are sure that there are none which may not be subdued by wise counsels and united exertions; and we are convinced that on YOU, *people of North Carolina*, it depends, whether the state shall or shall not become all which her warmest friends ought to desire for her.

"Be fruitful and multiply, and replenish the earth and SUBDUE it," announces to man the first direct command of his Creator, and a command rich with promised blessings. To subdue the earth, implies effort; effort would have been unnecessary, had not difficulties been purposely left for man to overcome; and HE who is all-wise and all-good, never would have imposed an obligation impossible to be fulfilled, nor have enjoined an act which was not pleasing in his sight. The subjugation of the earth can be effected but by labor—and the steady, judicious and economical application of labor to this purpose lies at the root of human prosperity. The extraordinary fertility of the Genesee country, like that of the valley of the Mississippi, no doubt attracted to it many citizens from the adjoining states, and many emigrants from foreign countries, and thereby hastened its settlement and growth. But, taken in the whole, it may well be doubted whether New York or Pennsylvania presented a better natural soil for the labors of the husbandman than was generally to be found in North Carolina; while, in the mildness of our winters, the higher value of the products of a southern climate, and the greater ease with which our earth is tilled, we had on our part decided advantages. But these were compensated, and more than compensated, by two physical blessings, bestowed on them in an eminent degree. Each of these had a port of safe and ready access from the ocean, and bold rivers penetrating far into the interior—possessing thus the means of cheap transportation to a home market, and of easy exportation to foreign ones. Marts were to be found within each state, for all that the industry of its citizens could produce; and the products of labor were not consumed by the expenses of reaching the place of sale. While adequate motives were thus furnished to excite agricultural industry, its success gave activity to mercantile adventure and employment to the mechanical arts. The profit of these built up capital, and capital led to enterprise, to the discovery of new sources of wealth, to the extension of facilities in business, to manufactures, to every species of improvement, and to general prosperity. The great wants of our state then are, emphatically, good marts of traffic and the means of cheap transportation. Until these can be supplied, our forests teem to little purpose with the luxuriant and valuable productions of nature, our alluvial lands present too feeble attractions to their general subjugation, and many of the mineral treasures with which our earth abounds, must lie undisturbed and even unexplored. Men cannot be well induced to labor for more than they can consume, unless the surplus may be conveniently exchanged for the commodities which refinement has made valuable, or can be stored up in accumulations for the winter of age, or the wants of posterity. While production is thus kept back, there is neither supply nor demand for commercial capital. The products actually made, because of the costs of transportation, are of little value, and there is therefore no increase of agricultural capital. Slovenly farming, slender traffic, and a languid circulation, general want of enterprise, inactivity and listlessness become habitual, and generation succeeds generation with scarcely a perceptible improvement in wealth, manners, science, or the arts.

If by a sudden dispensation of Providence, the shoals which endanger and impede our maritime navigation were removed, and the various streams which intersect our state were rendered fit for the purposes of conveyance from their very sources, all will admit, that we should spring forward with resistless energy to the consummation of our hopes. The impulse given to business of every sort would be felt in every section of the state, and in every department of industry. Let children indulge in day dreams; but it is for men to inquire whether they have not the power of supplying the deficiencies of nature, and of acquiring by their own exertions what, for wise purposes, was originally denied. Obstacles surmounted and difficulties subdued, as they are the best trials, so they become the noblest triumphs of virtue, intellect and courage. Often the most eminent among men have been trained up to fortitude and wisdom in the school of adversity; and the most illustrious of nations have usually passed through the stages of infancy and childhood, struggling for existence, gradually gaining and consolidating their strength, and by severe trials acquiring the qualifications and forming the habits which were to be displayed in the maturity of manhood: "Heaven grants the gifts, it grants the power to gain." Is the navigation of our rivers obstructed? To a considerable extent and with no mighty effort, we can remove these obstructions. Where these are not removable, or the streams are too shallow for boat navigation, or streams are wanting, experience has shown, that the canal, and still more, the railway, furnish better means of conveyance. As in no country are these more needed, so in none

can they be made at less expense. The process of effecting speedy and safe communications with the ocean has already commenced amongst us under the happiest auspices. Art, in this respect, signally triumphing over nature—dredge boats are removing in hours the slow accumulation of years; and we announce to you with joy that the day is not distant when our main outlets to the sea will afford ready passage to vessels of sufficient burden for all ordinary commercial purposes.—There is then ample room for exertion, but there is no cause for despondence.

We are aware that injudicious attempts, heretofore made in the cause of internal improvements, have prejudiced many against the renewal of any efforts at improvement. But prejudice is a wretched counsellor, whether it seeks to conceal the selfishness of the sordid and the fears of the timid, or is seen in the apathy of the sluggard, or speaks in the sneers of the scorner. We have attempted too many plans at once—we have frittered away our means over too great a space, and have expended much money in many silly schemes. Let us then profit by experience. Let it teach us caution, judgment, and a proper application of our resources. Let it guard us against the recurrence of former errors, but never let it repress exertion in the cause of duty. Others have, by a well devised and spirited course of internal improvements, brought incalculable blessings on their country. And why may not we? Are the people of this state, by some irreversible interdict of Providence, disqualified for improving their condition? If so, in what does this incapacity consist? Do they want mental energy? Look abroad and see the sons of North Carolina, wherever a field is presented, contending gallantly in every department of manly excellence for the palm of victory. We have been called an unpretending state, and long may it be before a wretched self-conceit shall cause that epithet to be exchanged for one less equivocal and far more to be abhorred. But if it were not a want of pretension—it would be self-degradation, ingratitude to God, and treachery to ourselves—to admit any inferiority for good or great purposes to the proudest among the members of this union. Do we want the pecuniary ability? If we were called on to raise at once a large sum of money to be sunk in the ocean, or transmitted to a distant land, it may be conceded that we could, with difficulty, comply with the requisition, and should severely feel the loss.

But it is among the striking effects of this system, to which we invite your attention, that it disburses within the community what the community furnishes, and returns speedily and in abundance all which it exacts. From the moment of its commencement, it creates neighborhood markets for labor, materials and provisions, and throws out money into brisk circulation. As it proceeds, it not only contributes by its profits to pay the interest on advances, but it extends more and more the sphere of activity; so that, independently of the immense benefits which it promises in the end, it pays in its progress by the excitement which it communicates to industry, and the impulse which it imparts to business of every description. Money thus employed is not sunk nor lost; but is money put out at compound interest. Such a course of expenditure and restitution is like that of the blood in a young and vigorous body. It gushes forth from the great reservoir, the heart, and is propelled through the arteries to the very extremities, enriching and strengthening the entire system in its course, but is returned by the veins to be again and again sent forth in a round of life-giving circulation. Our very poverty, then, the result as has been seen of unrewarded labor, languid trade and limited production, is the strongest reason which can be urged for engaging zealously in the system. The one vanishes as the other comes forward. True, we must have, or procure, wherewith to begin the experiment. But here there is no real difficulty. If each one amongst you will consent to set apart half of what he can spare without inconvenience to his family; if he who has not money will be ready to make his advance in timber, food, or work, we shall at once have a capital more than sufficient for the undertaking of every useful enterprise. But the state treasury ought to aid, and if you say so, will aid, in their accomplishment. Why has a public revenue been collected, if it is not to be used, and where is the advantage of public credit, if it is not to be employed, for the public good; and where is the service in which either can be more beneficially engaged? Is the character of the state part of the property of every one of its citizens? Does his heart throb with honest joy when he hears it mentioned with respect, or do his veins tingle with vexation when it is spoken of in the tone of taunt and derision?

Then tell your legislature, who have this holy treasure in their keeping, that in these days, when the spirit of improvement is abroad, and the strife for pre-eminence in the arts of life is carried on with chivalrous emulation, no state has character that advances not in this career. Are the employment of the poor, the encouragement of the industrious, and comforts of all classes of the community, objects worthy of the care of a paternal government? Would you furnish the means to instruct the ignorant, and lay deep the foundations of republican goverment in the education of every free child within your borders, however humble his origin or destitute his condition? Would you stay the flood of emigration which is sweeping from you by thousands the most adventurous of your youth, and remove the necessity which bids them abandon the home of their childhood and the graves of their fathers for some distant land where scope is to be found for exertion, and reward is offered to enterprise? Would you bring the grazier and the miner of the west, and the planter and farmer of the interior, into communion with the merchant and mechanic of the seaboard, and unite the integral but dissevered parts of North Carolina into one brotherhood of interest, feeling and patriotism? Would you command for her that respected station among the states of this union she ought to occupy, and assure to her a fair share in all its honors and of all its benefits? These—all these great, and good, and glorious purposes you may accomplish, but you can accomplish them in one way only. Internal improvement has effected them elsewhere—and can effect them here. But it is for *you* to give the impulse. Instruct your representatives to organize, and to prosecute with vigor a liberal system of Internal improvements. Direct them to cause to be ascertained the best plans for creat-

ing and improving markets, and for facilitating and cheapening transportation, and when ascertained, to forward them by a judicious and efficient application of the public resources. Chosen by you, and solicitous for your approbation, they carry into the legislative halls the spirit by which you are animated, and take from you that tone of voice which is heard in legislative enactments.

It may be asked, why has not the convention ventured to recommend some specific plan of improvement? Brought together suddenly from various sections of the state, and remaining in session but three days, had the members deemed themselves competent to make the recommendation, it is very obvious that they wanted the leisure for maturing a plan fit to be laid before you. But in fact the great purpose of the convention has been to awaken you to a sense of the vast importance and urgency of the subject, and if possible draw to it your earnest and united attention. If we succeed in rousing you to think seriously, and to commune freely, on the topics suggested, to strive to obtain and interchange accurate information, and to resolve after deliberate advisement in favor of internal improvements, specific plans may be hereafter much more advantageously devised and arranged. Our propositions, therefore, (for in truth they are but propositions,) are laid before you in the form of simple resolutions. With your sanction they may become the principles of state action, without it they are wholly inoperative. Examine, then, we intreat you, with the candor due to the motives that have prompted them, and the calmness and good sense and regard for the public good which ought to determine your judgment upon them. Call together such neighborhood and county and district meetings as will afford the most convenient opportunities for obtaining explanations, for interchanging views, for removing difficulties, and for forming, animating and ascertaining the public mind. Devise among yourselves such plans of improvement as your peculiar localities require, and apply at once to their execution the means which through your county courts are already in your hands, or arranged for procuring legislative sanction to them. And when your delegates shall assemble as we have proposed in November next, let them come together deeply imbued with your spirit, thoroughly apprised of your views, zealous and ready to work together in this great concern of the state.

Fellow-Citizens:—We owe to you as well as ourselves an explanation. There was a difference of opinion in the convention on one of the propositions now before you—on the resolution which declares that "true policy requires that the funds of the state ought in the first instance to be employed exclusively in providing the means of internal transportation, and in creating and improving markets within her limits." We shall not trouble you with the arguments which were respectively urged by those who supported, and by those who opposed this resolution. We, who address you, did ourselves differ on this proposition, but each knows that it was an honest difference of opinion among men, all zealous for the same end, and no one doubts or questions the patriotism of the rest. A majority approved of the resolution, and therefore it is submitted to you—and however you may decide, we are all and each of us ready to support your decision: we go—every man of us goes, for North Carolina and the whole of North Carolina. Improvement to be effectual must begin somewhere; but we hope it will reach every where. What gets not the benefit of it today, will, we trust, receive it to-morrow, and every successful experiment facilitates the next. It is our ardent hope and earnest prayer that, whatever spot this beneficent spirit shall select as the first scene of its operation, it will not desist from its kindly action, until its immediate as well as its general blessings shall have pervaded every part of the state. Too long has North Carolina been rent asunder by sectional jealousies and paltry local feuds. If she is ever to prosper, it must be by vigorous, persevering, and united action—by "a strong pull, a long pull, and a pull all together." For ourselves, we pretend to no exemption from the infirmities of nature, and are conscious that we respectively feel those partialities which bind men to their immediate vicinities. But we infinitely prefer the advancement of the state, *as a state*, to the prosperity of any portion of it; and it is because we do so, and know that we do so, that we hope for your approbation and ask for your concurrence.

WILLIAM GASTON, *Chair'm.*

G. E. Badger,	John D. Jones,
John H. Bryan,	Cad'r. Jones,
Wm. Boylan,	Wm. B. Meares,
Isaac Croom,	Fred'k. Nash,
Jos. J. Daniel,	John Owen,
Louis D. Henry,	S. F. Patterson,
John Huske,	Henry Seawell,
W. H. Haywood, Jr.	J. Somervell.
Jos. A. Hill,	Robert Strange.
James Iredell,	

Raleigh, July 20th, 1833.

COMMERCE AND IMPROVEMENT OF JAMES AND KANAWHA RIVERS.

To the inhabitants near the proposed line of connexion between the tide water of James River and the navigable waters of the Ohio.

Richmond, 16th August, 1833.

Fellow Citizens:—The terms offered by the legislature, at their last session, to the Bank of Virginia and the Farmers' Bank of Virginia, as inducements to subscribe to the James River and Kanawha Company, not having been accepted by both banks, it is now certain that the great work must fail, unless other and more energetic measures be adopted. Under a conviction of this truth, the citizens of Richmond convened on the seventh instant, and have appointed the undersigned a committee with instructions "to adopt such preliminary measures as they may deem expedient, to invite the attention of the people along the line of improvement to the necessity of prompt and vigorous action, and to endeavor to procure subscriptions to the stock."

The committee believe that they cannot better execute this resolution, than by urging you most earnestly to assemble in your respective counties to take this most important subject into your deliberate consideration, and to appoint an agent or agents in each county, to solicit subscriptions, or to adopt such other measures for the attainment of the object, so far as it depends on yourselves, as its magnitude requires and your judgment may dictate.

The deep stake which Virginia has in internal improvements generally, and more especially in the improvement of this great central route, which must directly benefit so large a portion of her territory, and can alone connect her with the rich and immense regions of the west, must be perceived by all. No Virginian can close his eyes to the humiliating truth that we no longer retain that place among the states of the union, which we filled at the commencement of our revolutionary struggle; or, to the still more humiliating truth, that not even our present relative importance can be maintained, unless we advance with our neighbors in that course which has aggrandized, and will continue to aggrandize them. If we remain stationary while they are rapidly moving forward, the distance between us must inevitably increase. If we neglect the bounteous gifts of Providence, while others turn them to the best account, the disparity must be greater. Separated or united, our relative inferiority must become daily more perceptible.

But these considerations ought to operate equally with every Virginian wherever he may reside. Our purpose is to invite your attention to those which apply almost exclusively to *yourselves*.

The increased facility, cheapness and safety with which your produce may be transported to market—the enhanced price of that produce, in consequence of the enlargement of that market and of its purchasing capital—the vast number of articles now wasted, which, in this change of circumstances, will become saleable, are truths too obvious to escape your notice. Places of deposite must multiply and grow into respectable villages, and the number of travellers between the west and the east be incalculably increased. The benefits resulting from these circumstances will be diffused through the country. A wilderness may be covered by an industrious, thriving population, and forests, over which wild beasts now roam, may be cultivated by man. These flattering prospects are not imaginary. They have been realized, to a greater or less extent, wherever internal improvements have been made. The same causes will continue to produce the same effects. These advantages will be as permanent as they are obvious. Others, though less permanent, will be, for a time, equally certain.

A large portion of the requisite labor may be performed by yourselves, and the compensation for it will be prompt and ample. Great part of the money will be expended in your own neighborhood, in the consumption of articles for which you have now no market. Immense augmentation in the value of every acre of land in the vicinity of the line of communication will be the inevitable result and reward of these improvements.

You are then urged, by the strongest motives that can operate on the human mind, to make those exertions without which your navigation, your roads and your country must at best remain what they now are. Not only will the commerce of those more distant regions, which nature destined for our ports, be diverted, and seek other markets, but the commerce of a great part of Virginia herself will pursue the same course, and will enrich other states. Measures are already in operation, which will infallibly produce this result, if we continue to neglect our own great interest.

You, who inhabit the country on the proposed line of communication, more especially the proprietors of the rich lands on and near the rivers, are urged by an enlightened view of your interests to promote the great work to which your attention is now solicited. In addition to the motives already suggested, you will never forget that the money invested in it, will have a double operation. While it will improve incalculably the value of your lands, it also acquires a property which ought to yield an income proportional to the expense incurred.

This object, so interesting to you, depends on your exertions. If you will do nothing for yourselves, you cannot hope that others will do every thing for you. We have thought it might be useful to remind you of the very inadequate contributions you have heretofore made towards it, and to show you, from authentic documents, how unequal your efforts have been to your means, and to show also the efforts and means of others. Thirteen counties, above Henrico and Chesterfield, adjoining James River, lying east of the Alleghany mountains, whose white population amounts to 89,074 persons, and whose real property is assessed at 33,565,022 dollars, have subscribed 1,750 shares. Four counties west of the Alleghany, and adjoining the contemplated line of communication, whose white population amounts to 23,806 persons, and whose real estate is assessed at $2,513,739, have subscribed 1,685 shares, of which 1,070 were taken at Charleston in the county of Kanawha.

The city of Richmond contains a white population of 7,755 persons, and the assessed value of its property is 5,803,466 dollars, and 10,024 shares have been subscribed on the books opened in this city. In addition to which, the corporation has subscribed 4,000 shares, making together a charge on the property of the city of 1,402,400 dollars, equal to about 180 dollars on each white inhabitant.

This immense disproportion between the exertions made by the city and those by the country, in a cause common to both, will be attested by the annexed document; and supposing every subscriber to comply with his engagement, which is quite improbable, the deficiency will still be 7541 shares.

We again most earnestly urge you to take this subject into your serious consideration, in general meeting, in your respective counties, and to adopt those efficient measures that may secure an object so vitally important to Virginia, and so particularly interesting to yourselves. The direct and obvious means is, to subscribe as liberally as your resources will permit; but other auxiliary measures are within your reach. Should you believe that alterations in the charter are indispensable to success—that farther legislative action can alone secure an object on which the prosperity of Virginia and of yourselves essentially depends, none can apply to the legislature with a fairer prospect of success than you. Your influence and your deep interest in the subject, will give a weight to your opinions, which cannot fail to be respected. While, therefore, we urge you by every consideration that can operate on patriots and on men, to come forward liberally as subscribers to this great work, we respectfully suggest

the propriety of submitting your views concerning it to your representatives.

JOHN BROCKENBROUGH,
J. MARSHALL,
RICHARD ANDERSON,
NICHOLAS MILLS,
JOHN RUTHERFOORD,
JOHN ENDERS,
JOSEPH S. JAMES.

—

Subscriptions in 1832, *to the James River and Kanawha Company.*

☞ No lists have been received for 1833.

Counties.	*Towns.*	*No. Shares.*
Albemarle,	Charlottesville	122
	Scottsville	347
Amherst,		86
Augusta,	Staunton	20
Botetourt,	Fincastle	249
	Pattonsburg	105
Buckingham,	Courthouse	330
	Bent Creek	50
Greenbrier,	Lewisburg	213
Henrico,	Richmond	10.024
Kanawha,	Charleston	1,070
Louisa,		26
Monroe,	Union	324
	Salt Sulphur Springs	69
	Red Sulphur Springs	9
Nelson,	Lovingston	45
Norfolk County,	Norfolk Borough	5
Rockbridge,	Lexington	345
Spottsylvania,	Fredericksburg,	20
		13,459 shares

	13,459
Corporation of Richmond,	4,000
Bank of Virginia,	5,000
	22,459
Required,	30,000
Deficient,	7,541 shares.

E. E. J. BROWN, Jr.
Second Auditor.

—

PRESERVING EGGS.

In 1820, a tradesman of Paris asked permission of the prefect of police to sell, in the market, eggs that had been preserved a year in a composition, of which he kept the secret. More than 30,000 of these eggs were sold in the open market, without any complaint being made, or any notice taken of them, when the board of health thought proper to examine them. They were found to be perfectly fresh, and could only be distinguished from others by a pulverous stratum of carbonate of lime, remarked by M. Cadet to be on the egg shell. This induced him to make experiments which ended in his discovering that they were preserved in highly saturated lime water. M. Cadet suggests adding a little saturated muriate of lime, but gives no reason. They may also be preserved by immersing them twenty seconds in boiling water, and then keeping them well dried in fine sifted ashes; but this will give them a grayish green color. The method of preserving them in lime water has been long the practice of Italy; they may be kept thus for two years. This useful mode is well known in many parts of England, and cannot be too much recommended.—[*Mechanic's Magazine.*

—

TO CORRESPONDENTS AND SUBSCRIBERS.

The communications on *Roads and Railways* as connected with the *interests of the Southern States*, on the *Influence of the Origin of Seeds*, &c. and some others, were received too late to be published in the present number of the Farmers' Register, but will make part of No. 5.

The address of SMEATON is desired.

Those persons who have written to inquire respecting *agencies, collections*, &c. are referred to the editoral advertisement on those subjects which was printed on the cover of No. 3. Subscribers who have not received all their copies, or who may fail to receive them hereafter, are requested to inform us; and the attention of our patrons and correspondents in general is invited to our former advertisement on this subject, on the cover of No. 3.

CONTENTS OF FARMERS' REGISTER, No. 4.

—

ORIGINAL COMMUNICATIONS.

On the influence of parentage on offspring, in breeding animals, 193—Means for reclaiming wastes formed by sea sands, 193—Reply to the remarks of G. W. F. and of Mockjack, on the "General Description of Virginia," 195.—Hints on marling and management of horses, 197—Stage horses, narrow leaf dock, &c. 199—Advantages and defects of agricultural societies, 200—Fallow: its various and contradictory significations, 202—Skippers in bacon, 203—Song of the bees, 203—Rake used in the valley, 203—The march of intellect and progress of the knowledge of political economy, in North Carolina, 204—The gypseous earth of James River, 207—Culture of corn, 212—Commercial report and present prospects of markets, 212—Means for preserving potatoes, 213—Effects of calcareous soil on health, diseased trees, potatoes, 214—Yellow locust, 214—Mr. Smith's collection of dahlias, description of the dahlia, 215—Expected speculations, 215—Extracts from private correspondence, comprising buffalo clover, gama grass, pounding oyster-shells, buckwheat, experiments with gypsum, moth weevil, query to rice growers, marsh mud, &c. &c. 216 to 218.

SELECTIONS.

Bees, 218—Strew salt over your asparagus beds, 218—Flour trade in the United States, 219—Tulipomania in Holland, and in Virginia, 219—Hints to housewives, 221—Rules for travellers and their horses, 222—Method of Generating new varieties of Fruit, 222—Rotation of Crops, 223—Apple Seed, 224—Process used by Nature to Heal the Wounds of Trees; Theory of Pruning, 225—Action of Poisons on Vegetable Structure, 226—Gama Grass, 227—China Leaves versus Weevil, 227—Formation of Vegetable Mould, 228—Salt used as Manure, 228—On Gypsum as a Manure, 228—Productive Farm, 229—Sheep Husbandry, 230—Domestic Silk in Virginia, 230—Lucerne, 230—Report on the State of Agriculture in Prince George, 235—Culture of Rice on the Embanked Marshes of Georgia, 236—Remarks on putting down Trunks in River Banks, 237—Interchange of opinions among Planters; Gama Grass; Hedges, 238—Deep Ploughing; Oyster Shell Lime; other Manures, 239—Gama Grass, 241—Silk Manufacture, 242—On raising Good Crops of Wheat and Corn, 242—Clover Manure for Wheat, 243—Manure is Wealth, 244—Gold Mines in Virginia; Gold in Buckingham, 244—Horse Rake, 244—Cultivation of Rye, 245—Application of Geology as the basis of the Science of Agriculture, 246—On Painting Houses, 249—Management of Bees, 250—On the Duration of Vitality in Garden Seed, 251—Internal Improvement of North Carolina, 251—Commerce and Improvement of James and Kanawha Rivers, 254—Preserving Eggs, 256—To correspondents and Subscribers, 256.